S. HRG. 109–410

FISCAL YEAR 2007 BUDGET REQUEST FOR THE DEPARTMENT OF ENERGY

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

SECOND SESSION

TO

CONSIDER THE PRESIDENT'S PROPOSED BUDGET FOR FISCAL YEAR 2007 FOR THE DEPARTMENT OF ENERGY

FEBRUARY 9, 2006

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CONTENTS

STATEMENTS

APPENDIXES

APPENDIX I

APPENDIX II

FISCAL YEAR 2007 BUDGET REQUEST FOR THE DEPARTMENT OF ENERGY

THURSDAY, FEBRUARY 9, 2006

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 9:34 a.m. in room SD–366, Dirksen Senate Office Building, Hon. Pete V. Domenici, chairman, presiding.

OPENING STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

The CHAIRMAN. The hearing will please come to order. Good morning, Mr. Secretary. Good morning, Senators. Let us proceed. I want to remind everyone the Secretary has been very generous in coming up here extremely early in this process. He is appearing here first because we wanted him to. But he has a very tough schedule, so 11:45—that is why we started earlier—is when he has to leave. We will do our very best. If it is urgent, we will call him back another time.

What we will do is Senator Bingaman and I will have some opening remarks. We will proceed, and he wants 10 to 15 minutes and we will put his whole statement in and then we will proceed one and one.

First of all, we are glad that you are here, not just to discuss the President's budget—that is the avowed purpose—but obviously there will be other questions asked because Senators are very interested in what is going on with the bill we passed last year and things like that.

Senator Bingaman, it is good to be with you again to get this started. I hope we have a good year working together. I would like to tell the Senators and those in the media that are interested we have introduced the Domenici-Bingaman-Dorgan-Coleman-Talent bill. It will take a substantial portion of Leasehold 181, 100 miles from the coast of Florida. It will say that we are making it available for lease soon. That is because of the tremendous positive impact it would have on the natural gas prices.

Now, having said that, I commend you for choosing the most exciting and challenging time to be in this administration with reference to the energy situation of our country. Last week at the core of the President's State of the Union Address was several comprehensive new programs to break America's dependence on foreign oil, and build America's competitive edge. We in this committee are very pleased that much of that was relegated to the Department

of Energy. We hope you are excited about that and we think you are the right person to implement it. It will not be easy.

Second, I want to commend the President for his comprehensive global nuclear strategy that promotes nuclear nonproliferation goals while helping to resolve the nuclear waste issues that remain. In the 1970's the United States decided to abandon its leadership on the nuclear recycling and let the rest of the world pass us by. With the creation of the global nuclear energy program—and we look forward to the details in the bill that you are going to send us soon, I hope, but what we know of it—we look forward, at least this Senator does, to getting back into the game that we abandoned, as I said, in my opinion in a very, very inappropriate—at a very inappropriate time for America's future.

Since the passage of the energy bill, we should now tell you, all of you, that there are 19 new reactors that are currently being planned. We understand from the Nuclear Regulatory Commission that that is the case. I think that means we did a good job in a bill on that particular issue. When you pass a bill and you see within 6 to 7 months the change, it means that we put something together that is pretty viable.

I am just going to move quickly. Recycling technologies that are discussed under GNEP are exciting. They are very long term, they are very controversial, but we look forward to working with you and hopefully we will have others helping with that very, very big project.

I am particularly impressed that this administration is doubling the funding in the next decade for the Office of Science. I think it should become a powerful office because science in the Department is powerful.

Finally but not least, the President has announced an Advanced Energy Initiative which aims to reduce our dependence on imported sources and commits $2.1 billion to meet that goal. That is an increase of $381 million. Some will say that is not enough. We ought to hear about that today. We are going to have to find money somewhere if we are going to do more.

The President has recognized that innovation and research are very important. We are very pleased that we were able to join him in the White House, Senator Bingaman and I, with Senator Alexander, in trying to talk him into this. I think he was already somewhat impressed with the area, but he did come forth with a large portion of the Augustine report, which is a very heralded competitiveness study for America, and we are hopeful that we are going to be able to implement it rapidly here in the U.S. Congress.

I mentioned Leasehold 181. It is separate from everything else, but I must say there is no other piece of American property, land, that could better help us with the natural gas problem that is beating our consumers to death and starving our energy of their most needed fuel.

Clean Coal Power Initiative, that has been reduced and we need an explanation of why. I think you have one. It has gone from $49 million to about $5 million.

The Energy Policy Act provided incentives—and I will close with this one, Mr. Secretary. When we were putting this energy bill together, people were saying, let us draw a national—let us draw a

bill that will get us to independence, and what do we want to do in these various areas to get us there. We set specific goals and specific programs, but we settled on a package of incentives for loan guarantees that could either be appropriated—that is, the portion of the cost—or could be done in a new manner where the borrower paid the risk, the risk dollars. That means that would not cost the budget anything.

We need that initiative started. It requires a lot of action on your part. If you have it started, it means that various projects that are moving ahead, be it solar, coal, ethanol, can be funded under loan guarantees. We hope today you will indicate to us that you are fully aware of that and that you choose to do what the Congress said and move ahead with it.

Thank you very much. Senators, I hope I did not take too much time. Now I yield to Senator Bingaman.

[The prepared statements of Senators Akaka, Bunning, Menendez and Smith follow:]

PREPARED STATEMENT OF HON. DANIEL K. AKAKA, U.S. SENATOR FROM HAWAII

Mr. Chairman, thank you for calling this timely hearing on the Department of Energy's FY 2007 budget. It's good to see you again, Secretary Bodman.

I am pleased to see an increase in hydrogen research and development—$53 million over last fiscal year—and for a new initiative for biomass and biofuels. I would like to have more details on the proposal for the Bio-Fuels Initiative and a "biorefinery" because I want to be sure that this proposal includes the potential for all types of cellulosic material, including sugar cane, pineapple, and other types of tropical biomass.

As you know, I have been a strong supporter of the Department's science and renewable energy programs; and I am pleased to see substantial increases in both these programs. The Solar America Initiative is promising, with $83 million more than FY 2006 spending levels. I hope it will lead to even greater use of solar power in Hawaii, which already has the greatest penetration of solar technology of any state in the nation.

Now let me state my concerns: The overall budget request for the Department of Energy for FY 2007 is virtually level-funded and amounts to an exercise in moving money around, so that the budget

- does not represent real increases in the investment in energy technologies, hydrogen or biomass; and,
- will result in decreases in other sound investments such as Weatherization and Geothermal programs.

In addition, I am also concerned about the elimination of Natural Gas Technologies programs. The Energy Policy Act of 2005 contains legislation that authorizes an expanded Gas Hydrates program, and I cannot understand why the Department of Energy continues to request no funding—zero!—for this program. Gas Hydrates represent a vast, potential source of clean energy and warrant an intensified research and development effort. Yet this year, in addition to zero funding, the Administration has decided to terminate this program.

I also notice that the Department did not request funding for the Hawaii Energy Study for FY 2007. This is a study, required by EPACT, that would be enormously useful for Hawaii, the most oil-dependent state in the nation. It is an inexpensive initiative to use scientific data and the assistance of the Department of Energy to help us determine the optimal route to reducing oil dependence—in essence, a model for the nation that will pay for itself many times over. I look forward to working with you on this and other initiatives.

Thank you, Mr. Chairman. I have some questions that I will ask during the question and answer period.

PREPARED STATEMENT OF HON. JIM BUNNING, U.S. SENATOR FROM KENTUCKY

Thank you, Mr. Chairman.

I think The Department of Energy Budget for fiscal year 2007 will be one of the most important in quite a while.

Not only do we have to address the pressing issues of high prices and energy security, but also we must ensure that the landmark energy bill we passed this past summer is given a chance to succeed. And that begins with the budget process.

I would like to say that I am very disappointed with the funding level for coal research and development. I believe that coal is America's answer to the difficult questions we are asking about high prices and energy independence. Now is the time to increase funding and prepare new technologies so we can bum coal cleaner and more efficiently.

Another area important to me is the legacy of nuclear research in the DOE. while the DOE has made commitments to the cleanup and to the workers of the Paducah Gaseous Diffusion Plant, I notice that funding levels are again being cut. i do not know how we can hope to have an accelerated cleanup of Paducah if these numbers don't start moving in the right direction.

I am hopeful that as we address coal technology and our overdependence on foreign oil, we can tackle important issues such as the development of ANWR, exploration of oil shale and tar sands and the promotion of biodiesel fuels. I look forward to hearing Secretary Bodman's plans for the future at DOE.

Thank you, Mr. Chairman.

PREPARED STATEMENT OF HON. ROBERT MENENDEZ,
U.S. SENATOR FROM NEW JERSEY

Thank you very much, Mr. Chairman, and Ranking Member Bingaman, it's an honor to be on this committee, and I'm looking forward to a very productive year here. I'd also like to thank the Secretary for being here to discuss the details of the department's budget, a budget that is going to have a major impact on the future of our nation and my home state of New Jersey. I was pleased to hear the President talk last week about trying to end our addiction to oil, reduce our dependence on foreign imports, and devote. additional resources to research into renewable energy and alternative fuels. However, I was not pleased when I saw the President's budget this Monday, because it appeared that his request did not match his rhetoric.

Instead of a new age Manhattan Project to break our dependence on foreign oil, we got baby steps such as a 22 percent increase in the renewable energy research budget. And while this is a worthwhile step, it still pales in comparison to the tax breaks for oil and gas exploration that were in last year's energy bill; a bill which recommended a much larger increase in the renewable energy research budget. The president touted an increase in the biofuels research and development budget from $90 million to $150 million, but the Energy Policy Act authorized $200 million for that research in FY07. Furthermore, funding for research into geothermal energy and hydropower, two promising clean energy alternatives, was completely eliminated.

America needs a comprehensive energy strategy; a strategy that advances technologies to make energy safer, cleaner, and less expensive, while taking real steps to increase national conservation. Both the President and the Secretary have recently talked about the importance of conservation and energy efficiency, but the budget contains big cuts for energy efficiency programs and research. In a time of record high energy prices, when we're trying to break our addiction to oil, this simply makes no sense.

One of the most shocking cuts in the budget is in the Weatherization program, which is losing 30% of its funding, meaning 30,000 fewer households would see the benefits of this program next year. This program has been tremendously successful, providing over 5 million families with sorely needed long-term energy assistance. While I'm a huge supporter of the Low-Income Home Energy Assistance Program (LIHEAP), that program simply allows families to cover their rapidly increasing home energy costs. Weatherization actually lowers energy costs, decreasing the need for LIHEAP assistance and making homes more energy efficient. LIHEAP is an essential stop-gap measure. Weatherization is a crucial long-term one. It provides over three dollars in benefits for every dollar spent, and saves us an estimated 15 million barrels of oil each year. I simply can not understand how the administration could talk about the need to conserve energy and break our dependence on foreign oil, yet propose a huge cut to this essential program.

The whole energy efficiency budget is actually quite disappointing. Vital programs like Energy Star, Clean Cities, and Vehicle Technologies are all seeing big cuts. The Federal Energy Management Program, which should set the example for the country by making the federal government more energy efficient, also gets a 12% cut. Quite simply, this budget is sending the wrong message to the American people.

Another item in the budget that concerns me is the $250 million for the Global Nuclear Energy Partnership, which would overturn three decades of United States policy about reprocessing of spent nuclear fuel. There are serious proliferation risks that go with this course of action, and the relatively limited detail that we have seen so far on this initiative does not fill me with confidence. In addition, a 1996 study by the National Academy of Sciences found it could take centuries to substantially reduce the amount of high-level waste that needs to be stored at a long-term repository. The last thing we need is another "Star Wars" style, pie-in-the-sky initiative that takes decades and costs tens of billions of dollars without actually delivering what was promised. While failures and mistakes in ballistic missile defense are embarrassing, failures and mistakes in a global nuclear reprocessing initiative could be catastrophic.

I agree with much of what the President said in his State of the Union last week. I believe we need to find alternative sources of energy and reduce our dependence on foreign oil. I just don't believe that this budget is a credible step towards getting us there.

PREPARED STATEMENT OF HON. GORDON SMITH, U.S. SENATOR FROM OREGON

Mr. Chairman, I appreciate your convening this hearing on the Department of Energy's fiscal year 2007 budget request. I also want to welcome Secretary Bodman here today.

Unfortunately, the members from the Pacific Northwest are once again confronting the latest proposal from the Office of Management and Budget that would raise electricity rates in the Pacific Northwest. This plan, which mandates that a portion of BPA's secondary revenues would be used to prepay debt, is nothing more than a rate increase in disguise.

I strongly oppose this proposal, which is bad public policy for numerous reasons. Northwest residents are still paying for the West Coast energy crisis of 2000-2001. BPA's rates today are already 46 percent higher than they were five years ago, as a result of huge price spikes during the crisis. While the economy of the Northwest has rebounded from the recession of 2000-2001, Oregon's unemployment rate remains above the national average. Even with these regional economic challenges, BPA has made its Treasury payments, and has actually prepaid over $1.4 billion in debt over the last five years.

I have been working with my colleagues for several years now to reduce BPA's operating costs, and to bring rate relief to its customers. This proposal would negate all of those efforts to bring down retail rates and retain energy-intensive industries in the Northwest.

OMB claims it can make the change administratively, but it is clearly inconsistent with congressional directives for the treatment of revenues and the rate setting requirements in BPA's governing statutes. Under the Transmission System Act of 1974, the BPA Administrator is to set rates at the lowest possible level consistent with sound business principles, and are to be set taking into consideration all revenues in order to repay bonds issued by the federal Treasury when they come due.

Earmarking a portion of BPA's revenues sets a bad precedent, and fails to take into consideration ongoing uncertainties surrounding river operations for fish, the appropriate level of carry-over reserves, or BPA's ability to meet its scheduled Treasury payments. This year, the proposal is for revenues from surplus sales over $500 million. What's to keep that number from being lowered in future budgets?

As a self-financing agency, BPA must be able to consider all its revenues when setting rates and establishing its Treasury repayment probability. It must also have the flexibility to respond to operating mandates and market conditions over time. I am concerned about the impact of this proposal on BPA's reserves. During the energy crisis, BPA used over $600 million in reserves to buy power to meet its contractual obligations.

Finally, from a nationwide perspective, it is my view that the Administration should be attempting to lower electricity and other energy costs across the nation, not to raise them. As U.S. companies struggle to compete in a global economy, they are already hampered by rising electricity prices and natural gas prices that are the highest in the industrialized world.

This proposal sends a terrible message to energy-intensive industries. In essence, the federal government would rather wring more money out of ratepayers for deficit reduction than pursue lower energy rates that would help keep U.S. businesses competitive.

This is not a theoretical problem. Last October, this committee received testimony that of the 120 large-scale chemical plants being constructed in the world, only one

was being built in the United States because of the high price of natural gas. At that time, natural gas prices in the U.S. were 20 times higher than they were in Saudi Arabia.

Secretary Bodman, you need to know that I will join with my colleagues from the Northwest to do what is necessary to prevent this ill-conceived proposal from being implemented.

Mr. Chairman, I also have concerns with other portions of the Energy Department's budget, such as the zeroing out of funds for geothermal research. I will have additional questions for the record on this and other items in the Department's budget.

STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR FROM NEW MEXICO

Senator BINGAMAN. Thank you very much.

Mr. Secretary, welcome and congratulations to you for the hard work you are putting in to try to move the country ahead in a lot of different areas. I thought I would focus on the budget as I understand it, and perhaps my understanding is erroneous in some respects. If it is, please tell me.

The budget that the Department of Energy has for this year is essentially flat compared to last year, and if you look at it in terms of the budgetary environment that we are in, that is not bad news. That is in some ways good news. But, if you look at it in terms of what we intended to get started with last year's energy bill, I do not think it is good news. It seems to me that a flat budget is not adequate to do the things that we promised to do in last year's Energy Policy Act, which I know you strongly supported.

The President declared when he signed that act back in August out in our State, Senator Domenici's State and mine, quote, "This bill launches an energy strategy for the 21st century." He also observed that: "Prior to the bill's enactment, for more than a decade America had gone without a national energy policy."

So obviously the question is, where is the funding to implement the new energy policy? I think there are some levels where there are some programs and some items in your budget that you are to be commended for, the President is, where clearly there are new resources. Let me mention some of those.

The Office of Science budget, Senator Domenici referred to that and I agree entirely. That is a step forward, the increased funding there. A substantial increase of a half billion dollars in energy science, 14 percent, that is very encouraging. Funding levels for solar energy and wind energy, biomass energy, those are also up and I commend you for those.

But there are other important programs that are being cut in the budget and in some cases those are areas that the President singled out in the past as being worthy of increased funding. Let me give you three examples. One example is the President gave special attention to energy efficiency. He said, quote: "This bill makes an unprecedented commitment to energy conservation and efficiency." An unprecedented commitment. The bill sets higher efficiency standards for Federal buildings, for household products, directs the Department of Transportation to study the potential for sensible improvements in fuel efficiency standards for cars and trucks and SUVs, and authorizes new funding for research into cutting edge technologies.

Yet, as I see this budget, as I understand it, those authorizations for cutting edge energy efficiency technologies are in fact proposed for cuts. The funding for energy efficiency in Federal buildings is proposed for significant cuts.

Another example is when the President signed the bill he favorably singled out some of the oil and gas programs that were authorized in there. He said: "The bill authorizes research into the prospects of unlocking vast amounts of energy now trapped in shale and tar sands." I believe last October you announced funding for 13 R&D projects aimed at tapping unconventional sources of natural gas, and that is funding that goes primarily to universities, national laboratories, independent oil and gas producers. When you announced those projects you said: "The projects we are focusing on today are an investment in our Nation's energy security and economic security and will help us obtain the maximum benefit of our domestic energy resources."

But those programs, as I understand your budget, are being zeroed out. This is at a time when I think we all agree that we need new technologies to boost domestic supplies of natural gas and oil.

The third example I would mention and then I will move on, is that the Department has proposed a 32 percent cut in low income weatherization programs, and this is of course at a time when home energy bills are at historic highs. The Energy Policy Act authorized $600 million for weatherization in 2007. The administration is requesting $164 million.

I asked my staff earlier this week if they would put together sort of a crosswalk between what was authorized in last year's bill and what is in budget request the President has submitted. We are going to have that available and give that to you. If you could have some of your budget experts look and see whether we are accurate in those comparisons, that would be useful, I think, as we put together our committee views and estimates to the Budget Committee. I hope that we can persuade the Budget Committee to make an additional allowance for implementation of the Energy Policy Act if in fact I am correct that we have not provided the resources that are necessary to fully implement that act.

I look forward to working with Chairman Domenici, and with other colleagues, Democrat and Republican, to see if we can get more funds appropriated to implement the provisions of that act. I think the items I mentioned and many others that are dealt with in your budget, they are high priorities for members of this committee, both Democrat and Republican, areas such as energy efficiency, oil and natural gas, clean coal. I think those are areas where, as I understand the budget, the administration has not requested levels of funding that would allow the act to be implemented properly. So I hope that that can be corrected as we go through the budgetary process and the appropriations process.

Thank you very much for having the hearing, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Bingaman.

Now we are going to proceed. Mr. Secretary, your statement is made a part of the record as of now and you can proceed, please.

STATEMENT OF HON. SAMUEL BODMAN, SECRETARY, DEPARTMENT OF ENERGY

Secretary BODMAN. Thank you, Senator. Good morning, Mr. Chairman. Good morning, Senator Bingaman. I would just say at the outset, Senator Bingaman, that we will be happy to look at whatever information you provide for us and give you the feedback that you request.

I am very pleased to be here to talk about the budget, as we believe that this is quite an exciting time in this Department and we are very enthused, I am very enthused, about the prospects in the number of areas that have already been talked about.

As you heard the President in his State of the Union Address, he announced several new energy priorities, including two key presidential initiatives that will be very crucial to the future work of this Department. These new priorities, as well as our other important missions, are spelled out in detail in my written testimony. If I may, I will take this opportunity to give you a few highlights, at least from my standpoint, of our $23.5 billion budget request.

The 2007 budget request includes a $505 million increase in our science programs, which is part of the President's competitiveness initiative. That is a 14 percent increase. It is a big number and it is something that I think will have long-term implications, not just to energy but to our economy generally.

In order to ensure that our country remains at the forefront of an increasingly competitive world, our Department will be pursuing what we have come to call transformational technologies, new technologies in cutting edge scientific fields that will be the crucial area of science in the 21st century, areas like nanotechnology, materials science, biotechnology, as well as high-speed computing.

The President also announced an Advanced Energy Initiative to increase spending on clean energy sources that will transform our transportation sector, indeed the whole economy, and reduce our dependence on imported fossil fuels. Specifically, the 2007 budget request proposes $149 million for biomass and biofuels programs and a like amount, $148 million, for solar energy to support the Solar America program. In addition, the budget requests a total of $288 million to support implementation of the President's hydrogen fuel initiative.

As a part of the President's Advanced Energy Initiative, the Department's 2007 budget also features $250 million to begin investments in the Global Nuclear Energy Partnership that the chairman has already alluded to. This is a groundbreaking, new, and what we hope will be an international effort to help meet the world's rapidly growing electricity needs with safe, emissions-free nuclear power, while enhancing our ability to keep nuclear technology and material out of the hands of those who seek to use it for non-peaceful purposes.

As a complement to the GNEP strategy, the Department will continue to pursue a permanent geological storage site for nuclear wastes at Yucca Mountain and the budget, the 2007 budget, includes $544 million to support that goal.

For NNSA the budget proposes a total of $9.3 billion for 2007, a $211 million increase that is largely devoted to nonproliferation.

$111 million of that increase is in the Defense Nuclear Nonproliferation Program and will accelerate efforts to secure nuclear materials in the Soviet Union and advance an aggressive global nonproliferation agenda.

Finally, the budget request also focuses on other key priorities. To meet our environmental commitments, the budget submission requests $5.8 billion to clean up legacy nuclear waste sites. We recently announced the completion of cleanup at Rocky Flats, a former nuclear weapons plant located outside of Denver. In 2006, DOE will complete environmental cleanup of the Fernault and Columbus sites in Ohio and the Sandia National Laboratory in New Mexico, as well as several other smaller sites.

Mr. Chairman, there are many other productive and promising initiatives under way at the Department, and I will stop my comments here and look forward to answering your questions. Thank you.

[The prepared statement of Secretary Bodman follows:]

PREPARED STATEMENT OF HON. SAMUEL W. BODMAN, SECRETARY OF ENERGY

Good morning, Mr. Chairman and Members of the Committee. I am pleased to appear before you today to discuss the President's Fiscal Year (FY) 2007 budget request for the Department of Energy (DOE).

Over the last five years America has faced and overcome many challenges. From the U.S./Canada Power Blackout of August 2003, to the devastation caused by hurricanes Katrina and Rita, now more than ever, American families understand the key relationship between our Nation's energy security and America's economic security.

It is with this in mind that the Department of Energy's budget for FY 2007 was crafted. The $23.5 billion budget request seeks to address America's short-term energy needs while positioning us for the future. The budget request makes bold investments to improve America's energy security while protecting our environment, puts policies in place that foster continued economic growth, spurs scientific innovation and discovery, and helps address the threat of nuclear proliferation.

Most notably, this budget request contains:

- *A Landmark Investment in Scientific Research*—The FY 2007 budget includes a $505 million increase in DOE's Science programs, which is part of a commitment to double funding for certain high-leverage science agencies over the next ten years. The *American Competitiveness Initiative* recognizes that scientific discovery and understanding help drive economic strength and security. Developing revolutionary, science-driven technology is at the heart of the Department of Energy's mission. The increase proposed for the Department's Science programs reflects the significant contribution DOE and its world-class research facilities make to the Nation.
- *Strategic Investments to Reduce America's Dependence on Foreign Oil and Develop Clean Energy Technologies*—The President's *Advanced Energy Initiative* provides a 22 percent increase for research that can help reduce America's dependence on foreign oil and advance clean energy technologies. The FY 2007 Budget proposes $149.7 million for Biomass and Biorefinery Systems Research and Development (R&D) program to support the new *Biofuels Initiative* to develop cost competitive ethanol from cellulosic materials (agricultural wastes, forest residues, and bioenergy crops) by 2012. In addition, the budget request continues to pursue the vision of reducing America's dependence on foreign oil, reducing air pollution, and reducing greenhouse gas emissions through the development of a hydrogen economy. The FY 2007 Budget requests a total of $289.5 million (including $1.4 million requested by the Department of Transportation) to support implementation of the *President's Hydrogen Fuel Initiative.* The FY 2007 Budget also provides a 27 percent increase for advanced battery technologies that can improve the efficiency of conventional hybrid electric vehicles (HEV) and help make "plug-in" HEVs commercially viable.

  To help develop clean electricity, the FY 2007 Budget funds diverse technology R&D programs. The FY 2007 Budget includes $148.4 million for a new *Solar America Initiative* to develop cost competitive solar photovoltaic technology by 2015. The FY 2007 Budget also provides $60.0 million for U.S. partici-

pation in *ITER,* an international experimental reactor program that has the potential for putting us on a pathway to tap nuclear fusion as an enormous source of plentiful, environmentally safe energy. The FY 2007 advances the Administration's commitment to the *FutureGen* project, which will establish the capability and feasibility of co-producing electricity and hydrogen from coal with near-zero atmospheric emissions of pollutants and greenhouse gasses.

- *Strategic Investments to Enable Nuclear Energy Expansion in a Cleaner, Safer Manner*—The Department's FY 2007 budget features $250 million to begin investments in the Global Nuclear Energy Partnership (GNEP). GNEP is a comprehensive strategy to enable an expansion of nuclear power in the U.S. and around the world, to promote non-proliferation goals; and to help resolve nuclear waste disposal issues.

  The Energy Information Administration (EIA) projects that over the next 25 years, demand for electricity in the United States alone will grow by over 40 percent. Nuclear power is an abundant, safe, reliable and emissions-free way to help meet this growing demand for energy throughout the world. As part of the GNEP strategy, the United States will work with key international partners to develop and demonstrate new proliferation resistant technologies to recycle spent nuclear fuel to reduce waste. To help bring safe, clean nuclear power to countries around the world, the international GNEP partners will also develop a fuel services program to supply developing nations with reliable access to nuclear fuel in exchange for their commitment to forgo developing enrichment and recycling technologies.

  As a complement to the GNEP strategy, the Department will continue to pursue a permanent geologic storage site for nuclear waste at *Yucca Mountain,* and the FY 2007 budget includes $544.5 million to support this goal. Based on technological advancements that would be made through GNEP, the volume and radiotoxicity of waste requiring permanent disposal at Yucca Mountain will be greatly reduced, delaying the need for an additional repository indefinitely.

  GNEP builds upon the successes of programs initiated under President Bush's leadership to encourage the construction of new nuclear power plants here in the U.S. The FY 2007 budget includes $632.7 million for nuclear energy programs, a $97.0 million increase above the FY 2006 appropriation. In addition to the $250 million for GNEP within the *Advanced Fuel Cycle Initiative, Generation IV* (Gen IV) research and development ($31.4 million) will improve the efficiency, sustainability, and proliferation resistance of advanced nuclear systems and Nuclear Power 2010 ($54.0 million), will lead the way, in a cost-sharing manner, for industry to order new, advanced light-water reactors by the end of this decade.

  In addition, ongoing implementation of the Energy Policy Act of 2005 (EPACT) will establish federal insurance to protect sponsors of the first new nuclear power plants against the financial impact of certain delays during construction or in gaining approval for operation that are beyond the sponsors' control.
- *Strengthening America's National Security Commitments*—In the area of national security, the budget proposes a total of $9.3 billion in FY 2007, a $211.3 million increase from the FY 2006 appropriation. At $6.4 billion, *Weapons Activities* remain essentially level with the FY 2006 appropriations to continue the transformation of the Nation's nuclear deterrent and supporting infrastructure to be more responsive to the threats of the 21st Century. The majority of the increase, $111.4 million, is in Defense Nuclear Nonproliferation programs to accelerate efforts to secure nuclear material in the former Soviet Union and advance an aggressive global nuclear nonproliferation agenda.

The Department of Energy's budget request also focuses on other key priorities. To meet our environmental cleanup commitments arising from nuclear activities during the Manhattan Project and the Cold War, the budget submission requests $5.8 billion to clean up legacy nuclear waste sites. DOE has accelerated cleanup at the legacy nuclear waste sites and recently announced completion of cleanup at Rocky Flats, a former nuclear weapons plant located outside of Denver, Colorado. In 2006, DOE will also complete environmental cleanup of the Fernald and Columbus sites in Ohio, the Sandia National Laboratory in New Mexico, and several other sites.

To continue to provide budgetary rigor and provide a public planning context for programmatic decisions, the Department expanded the development of *five-year budget plans,* including detailed five-year plans for the Department's major programs. This multi-year planning effort assures that the FY 2007 budget decisions

are based on a sound corporate approach to allocating scarce financial resources to our most compelling priorities.

Reflected throughout the FY 2007 budget are the integration of performance measures and the incorporation of sound business practices in the Department's operation consistent with the President's Management Agenda. We also have established straight-forward operating principles which set the tone for further improving the management of the Department. These principles are:

- Accept no compromises in safety and security
- Act with a sense of purposeful urgency
- Work together, treating people with dignity and respect
- Make the tough choices
- Keep our commitments
- Manage Risk through informed decisions

PROMOTING SCIENCE AND TECHNOLOGICAL INNOVATION

As the millennium unfolds, we stand on the threshold of scientific revolutions in biotechnology and nanotechnology, in materials science, in fusion energy and high-intensity light sources, and in high-speed computing, to touch on only a few important fields. The nations that lead these scientific revolutions will likely dominate the global hi-tech economy for the foreseeable future. We are on the verge of major new discoveries about the nature of our universe, solutions to some of the deepest mysteries of the cosmos and the fundamental understanding of matter—insights that will transform the way we think about ourselves and our world.

The President's *American Competitiveness Initiative* will encourage American innovation and bolster our ability to compete in the global economy through increased federal investment in critical areas of research, especially in the physical sciences and engineering. This initiative will generate scientific and technological advances for decades to come and will help ensure that future generations have an even brighter future.

Twenty-first century science requires sophisticated scientific facilities. In many fields, private industry has neither the resources nor the near-term incentive to make significant investments on the scale required for basic scientific research to yield important discoveries. Indeed, in recent years, corporate research has declined. That is why the Department's Office of Science, which is responsible for ten world-class U.S. national laboratories and is the primary builder and operator of scientific facilities in the United States, plays such a critical role. Investment in these facilities is much more than bricks and mortar; it is an investment in discovery and in the future of our Nation. The Office of Science is also educating and training our next generation of scientists and engineers. Roughly half of the researchers at Office of Science-run facilities are university faculty or graduate or postdoctoral students (who work side by side with scientists and researchers employed directly by the labs), and about a third of Office of Science research funds go to institutions of higher learning. In addition, the NNSA operates three world-class national laboratories which greatly advances the frontiers of science in connection with their national security mission and which have many interactions with universities.

I am pleased to inform the Committee that the Department is already achieving meaningful scientific results with our latest high-end supercomputing systems, including Blue Gene L and Purple at Lawrence Livermore National Laboratory and our Red Storm supercomputer at Sandia National Laboratory. Within a month of coming online, weapons designers at Lawrence Livermore and Los Alamos, working jointly, have discovered key physics that is important to weapons design that could not have been identified using less capable computers. This discovery is critically important to predicting the behavior of weapons, and, as a result, our ability to be responsive to national needs. Because of the interrelationships among the Department's science-based programs, these new, remarkably powerful computers are already having a major, positive effect on science in several of our laboratories.

The President's FY 2007 budget request of $4.1 billion for the Office of Science will move us forward on several scientific fronts designed to produce discoveries that will strengthen our national competitiveness. Final international negotiations are close to being completed with our international partners in *ITER,* the fusion experimental reactor designed to demonstrate the scientific and technological feasibility of fusion energy. Capable of producing a sustained, burning fusion fuel, ITER will be the penultimate experiment before commercialization of fusion as a plentiful, environmentally friendly source of energy. A request of $60.0 million in FY 2007 provides funding for the second year of the ITER project. The return on investment will expand across international borders and has the promise of tremendous economic opportunity and development.

The FY 2007 budget also includes $105.9 million to enable us to continue construction of the *Linac Coherent Light Source* (LCLS), the world's first x-ray free electron laser. The LCLS will allow us to watch matter in action, one molecule at a time, and witness chemical reactions at the microscopic level in real time. The structural knowledge obtained with x-rays holds the key to understanding the properties of matter such as mechanical strength, magnetism, transport of electrical currents and light, energy storage, and catalysis. Likewise, in biology much of what we know about structure and function on a molecular level comes from x-ray studies. Such knowledge forms the basis for the development of new materials and molecules and the enhancement of their properties, which in turn will advance technology, fuel our economy, and improve our quality of life. In addition, the FY 2007 Budget seeks $19.2 million in FY 2007 for the first full year of operations of each of four facilities for nanoscience research and $19.4 million to continue with construction of a fifth.

The FY 2007 budget provides $171.4 million for the *Spallation Neutron Source (SNS),* which enters its first full year of operation as the world's foremost facility for neutron scattering.

The FY 2007 budget request also includes $135.3 million for the *Genomes: GTL* research, which will help us understand how nature's own microbial communities can be harnessed to remove carbon from the atmosphere, generate hydrogen for fuel, and turn cellulose into ethanol.

Within the $4.1 billion FY 2007 budget request for Science, $143.3 million is provided to support near full operation of the *Relativistic Heavy Ion Collider (RHIC),* which gives us a lens into the early universe, and $80.0 million is allocated to allow near full operation of the *Continuous Electron Beam Accelerator Facility (CEBAF),* which will give new insight on the quark-structure of matter. Early studies of nuclear and particle physics provided the foundation for technologies that have changed our daily lives, giving us televisions, transistors, medical imaging devices, and computers, and has enormous potential to lead to unexpected discoveries. The *Large Hadron Collider (LHC)* at CERN, scheduled to be completed in 2007, will open a new chapter in illuminating the structure of matter, space and time. At this new energy frontier, qualitatively new phenomena of nature should emerge. There are many possibilities—supersymmetry, extra space dimensions, or unexpected new symmetries of nature—but finding out which, if any, are true can only be settled by experiment. In FY 2007, $56.8 million is requested to support U.S. participation in the LHC research program. The new results anticipated at the LHC can be significantly advanced by discoveries at a potential next generation International Linear Collider (ILC) which would break new ground in our understanding of nature. In FY 2007, the ILC funds for research and development are doubled with a funding request of $60.0 million.

The budget also includes $318.7 million to solidify America's leadership in the economically vital field of *high-speed computing,* a tool increasingly integral not only to advanced scientific research, but also to industry. The budget will provide the pathway toward a point when computers will be so powerful that researchers will be able to attack a wide range of previously impossible scientific problems through modeling and simulation, enabling the U.S. to maintain leadership in this strategic area. Additionally, from development of the suite of scientific software and applications for the petascale computers, U.S. industry will be able to accelerate innovation, saving billions in development costs and giving our economy untold competitive advantages.

We are, in short, on the verge of a revolution across multiple sciences as profound as any humanity has witnessed—one that will transform our vision of nature and, ultimately, our industry and economy.

ADVANCING AMERICA'S ECONOMIC AND ENERGY SECURITY

The Energy Policy Act of 2005, signed by President Bush on August 8, 2005, serves as a roadmap to help lead the United States to a secure energy future. The FY 2007 budget request of $2.6 billion to support energy programs fulfills President Bush's pledge to promote a strong, secure economy and expand our Nation's energy supply by developing a diverse, dependable energy portfolio for the future.

The President has proposed the *Advanced Energy Initiative* to help reduce America's dependence on foreign sources of oil and accelerate development of clean energy technologies through targeted increases in federal investment.

The FY 2007 budget request of $1.2 billion for *energy efficiency and renewable energy* activities reallocates resources to emphasize technologies with the potential for reducing our growing reliance on oil imports and for producing clean electricity with reduced emissions. It includes two new Presidential initiatives; Biofuels and Solar America. The FY 2007 budget proposes $149.7 million for the *Biofuels Initiative* to

develop by 2012 affordable, domestically produced bio-based transportation fuels, such as ethanol, from cellulosic feedstocks (such as agricultural wastes, forest residues, and bioenergy crops), and encourage the development of biorefineries. Biomass has the promise to deliver a plentiful domestic energy resource with economic benefits to the agricultural sector, and to directly displace oil use. The *Solar America Initiative* accelerates the development of solar photovoltaics, a technology that converts energy from the sun into electricity in a highly efficient manner. Further development can help this emissions-free technology achieve efficiencies to make it cost-competitive with other electricity generation sources by 2015. The FY 2007 Budget provides $148.4 million for the *Solar Energy Program* that comprises the initiative.

In addition to funding increases for biomass and solar energy, the Energy Efficiency and Renewable Energy budget request includes $195.8 million to support continued research and development in *hydrogen and fuel cell technology* which holds the promise of an ultra-clean and secure energy option for America's energy future. The increase of $40.2 million above the FY 2006 appropriation accelerates activities geared to further improve the development of hydrogen production and storage technologies, and evaluate the use of hydrogen as an emissions-free transportation fuel source. The President's *Hydrogen Fuel Initiative* is funded at $289.5 million and includes $195.8 million for DOE's Energy Efficiency and Renewable Energy program, $23.6 million for DOE's Fossil Energy program, $18.7 million for DOE's Nuclear Energy program, $50.0 million for DOE's Science program, and $1.4 million for the Department of Transportation.

While the budget proposes increases for Biomass, Solar and Hydrogen research, the Geothermal Program will be closed out in FY 2007 using prior year funds. The 2005 Energy Policy Act amended the Geothermal Steam Act of 1970 in ways that should spur development of geothermal resources without the need for subsidized Federal research to further reduce costs.

Nuclear power, which generates 20 percent of the electricity in the United States, contributes to a cleaner, more diverse energy portfolio. In FY 2007 a total of $632.7 million is requested for nuclear energy activities. Within the total, $250 million will support the *Global Nuclear Energy Partnership (GNEP).* GNEP is a comprehensive strategy to enable an expansion of nuclear power in the U.S. and around the world, to promote nuclear nonproliferation goals; and to help resolve nuclear waste disposal issues.

GNEP will build upon the Administration's commitment to develop nuclear energy technology and systems, and enhance the work of the United States and our international partners to strengthen nonproliferation efforts. GNEP will accelerate efforts to:

- Enable the expansion of emissions-free nuclear power domestically and abroad;
- Reduce the risk of proliferation; and
- Utilize new technologies to recover more energy from nuclear fuel and dramatically reduce the volume of nuclear waste.

Through GNEP, the United States will work with key international partners to develop new recycling technologies that do not result in separated plutonium, a traditional proliferation risk. Recycled fuel would then be processed through advanced burner reactors to extract more energy, reduce waste and actually consume plutonium, dramatically reducing proliferation risks. As part of GNEP, the U.S. and other nations with advanced nuclear technologies would ensure developing nations a reliable supply of nuclear fuel in exchange for their commitment to forgo enrichment and reprocessing facilities of their own, also alleviating a traditional proliferation concern.

GNEP will also help resolve America's nuclear waste disposal challenges. By recycling spent nuclear fuel, the heat load and volume of waste requiring permanent geologic disposal would be significantly reduced, delaying the need for an additional repository indefinitely.

The Administration continues its commitment to open and license Yucca Mountain as the nation's permanent geologic repository for spent nuclear fuel, a key complement to the GNEP strategy. Managing and disposing of commercial spent nuclear fuel in a safe and environmentally sound manner is the mission of DOE's Office of Civilian Radioactive Waste Management (RW).

To support the near-term domestic expansion of nuclear energy, the FY 2007 budget seeks $54.0 million for the *Nuclear Power 2010* program to support continued industry cost-shared efforts to reduce the barriers to the deployment of new nuclear power plants. The technology focus of the Nuclear Power 2010 program is on Generation III+ advanced light water reactor designs, which offer advancements in safety and economics over the Generation III designs. If successful, this seven-year,

$1.1 billion project (50% to be cost-shared by industry) could result in a new nuclear power plant order by 2009 and a new nuclear power plant constructed by the private sector and in operation by 2014.

Funding of $1.8 million is provided in FY 2007 to implement a new program authorized in the recently enacted Energy Policy Act of 2005. The program will allow DOE to offer *risk insurance* to protect sponsors of the first new nuclear power plants against the financial impact of certain delays during construction or in gaining approval for operation that are beyond the sponsors' control. This program would cover 100 percent of the covered cost of delay, up to $500 million for the first two new reactors and 50 percent of the covered cost of delay, up to $250 million each, for up to four additional reactors. This risk insurance offers project sponsors additional certainty and incentive to provide for the construction of a new nuclear power plant by 2014.

The FY 2007 budget request includes $31.4 million to continue to develop Next-generation nuclear energy systems known as *Generation IV (GenIV).* These technologies will offer the promise of a safe, economical, and proliferation resistant source of clean, reliable, sustainable nuclear power with the potential to generate hydrogen for use as a fuel. Resources in FY 2007 for GenIV will be primarily focused on long-term research and development of the Very-High Temperature Reactor.

The *University Reactor Infrastructure and Educational Assistance* program was designed to address declining enrollment levels among U.S. nuclear engineering programs. Since the late 1990s, enrollment levels in nuclear education programs have tripled. In fact, enrollment levels for 2005 have reached upwards of 1,500 students, the program's target level for the year 2015. In addition, the number of universities offering nuclear-related programs also has increased. These trends reflect renewed interest in nuclear power. Students will continue to be drawn into this course of study, and universities, along with nuclear industry societies and utilities, will continue to invest in university research reactors, students, and faculty members. Consequently, Federal assistance is no longer necessary, and the 2007 Budget proposes termination of this program. The termination is also supported by the fact that the program was unable to demonstrate results from its activities when reviewed using the Program Assessment Rating Tool (PART), supporting the decision to spend taxpayer dollars on other priorities. Funding for providing fresh reactor fuel to universities is included in the Research Reactor Infrastructure program, housed within Radiological Facilities Management.

Recognizing the abundance of coal as a domestic energy resource, the Department remains committed to research and development to promote its clean and efficient use. U.S. coal accounts for twenty five percent of the world's coal reserves. For the last three years, the Department has been working to launch a public-private partnership, *FutureGen,* to develop a coal-based facility that will produce electricity and hydrogen with essentially zero atmospheric emissions. This budget includes $54 million in FY 2007 and proposes an advance appropriation of $203 million for the program in FY 2008. Funding for FutureGen will be derived from rescinding $203 million in balances no longer needed to complete active projects in the Clean Coal Technology program. Better utilization of these fund balances to support FutureGen will generate real benefits for America's energy security and environmental quality.

The budget request for FY 2007 includes $4.6 million to support *Alaska Natural Gas Pipeline* activities authorized by Congress in late 2004. Within the total amount of $4.6 million, $2.3 million will be used to support an Office of the Federal Coordinator and the remaining $2.3 million will support the *Loan Guarantee* portion of the program. Once constructed, this pipeline will be capable of delivering enough gas to meet about ten percent of the U.S. daily natural gas needs.

The budget request proposes to terminate the oil and gas research and development programs, which have sufficient market incentives for private industry support, to other energy priorities.

The Energy Policy Act of 2005 established a new mandatory oil and gas research and development (R&D) program, called the Ultra-Deep and Unconventional Natural Gas and Other Petroleum Research program, that is to be funded from Federal revenues from oil and gas leases beginning in FY 2007. These R&D activities are more appropriate for the private-sector oil and gas industry to perform. Therefore, this budget proposes to repeal the program through a future legislative proposal.

The FY 2007 budget includes $124.9 million for a refocused portfolio of energy reliability and assurance activities in the *Office of Electricity Delivery and Energy Reliability.* This will support research and development in areas such as high temperature superconductivity, and simulation work needed to enhance the reliability and effectiveness of the Nation's power supply. This office also operates the Depart-

ment's energy emergency response capability and led DOE's support effort during and after the Gulf Coast hurricanes.

The Department of Energy's *Power Marketing Administrations (PMAs),* consisting of the Southeastern (SEPA), Southwestern (SWPA), Western Area (WAPA) and Bonneville Power Administrations (BPA), play an important role in meeting energy demands and fueling our economy. The electricity generated at Federal hydroelectric facilities and sold by the PMAs represents four percent of the Nation's electricity supply. In FY 2007, $229 million is requested for SEPA, SWPA, and WAPA to continue their activities.

The budget includes a proposal that sets the interest rate for certain new obligations incurred by SEPA, SWPA and WAPA paid to the Treasury for power related investments at the rate Government corporations borrow in the market. This rate is similar to the interest rate current law sets for BPA borrowing from the U.S. Treasury. However, this change applies only to investments whose interest rates are not set by law. These three PMA obligations due to Treasury currently outstanding will continue to retain existing interest rates. This is expected to result in a rate increase of less than 1 percent paid by some PMA customers. This change is expected to increase total receipts to the U.S. Treasury, beginning in FY 2007, by approximately $2-3 million annually.

BPA, unlike the other three PMAs, is "self financed" by the ratepayers of the Pacific Northwest and receives no annual appropriation from Congress. BPA funds the expense portion of its budget and repays amounts it has borrowed from the Treasury as well as certain Federal investments with revenues from electric power and transmission rates.

The President's FY 2007 Budget provides, consistent with sound business practices required under the Federal Columbia River Transmission Act of 1974, that BPA will use any net secondary revenues it earns above $500 million annually to make early payments on its federal bond debt to the U.S. Treasury. Due to high energy prices, these net secondary revenues could be significantly higher than historical levels, especially in the next three years. The budget reflects $924 million from FY 2007-2016 from these higher-than-historical net secondary revenues. Absent implementation of the Budget proposal, BPA could run out of borrowing authority from the U.S. Treasury, and therefore limiting BPA's ability to invest in energy infrastructure, as early as 2011.

BPA will promptly commence an expedited rate case to implement the policy provided in the President's budget. As BPA announced today in the *Federal Register*, BPA will be holding pre-rate case workshops starting in March to address technical issues relating to the expedited rate case. The 90-day expedited rate proceeding will begin in July 2006. DOE and BPA look forward to hearing from stakeholders and to implementing the policy in the upcoming rate proceeding. As Secretary of Energy, I will ensure BPA implements sound business practices.

In addition, the FY 2007 budget provides that Energy Northwest will refinance a portion of its debt in calendar years 2006 and 2007. During FY 2006 and FY 2007, these deficit reduction proposals should allow $1.3 billion in additional U.S. Treasury borrowing authority to become available to BPA.

ADVANCING AMERICA'S NATIONAL SECURITY

The National Nuclear Security Administration (NNSA) continues significant efforts to meet Administration and Secretarial priorities by conducting fundamental and applied scientific research and development, and applying that science to promote national security. The FY 2007 budget proposes $9.3 billion to meet defense-related objectives. The budget request maintains commitments to the nuclear deterrence requirements of the Administration's Nuclear Posture Review (NPR) and continues to fund an aggressive strategy to mitigate the threat of weapons of mass destruction. Key investments include:

- Transforming the nuclear weapons stockpile and infrastructure while meeting Department of Defense requirements;
- Conducting innovative programs in the former Soviet Union and other countries to address nonproliferation priorities;
- Supporting naval nuclear propulsion requirements for the nuclear Navy;
- Providing nuclear emergency response assets in support of homeland security.

Weapons Activities: The United States continues a fundamental shift in national security strategy to address the realities of the 21st century. The Administration's NPR addresses a national security environment in which threats may evolve more quickly and be less predictable and more variable than in the past. The NPR recognizes the need to transition from a threat-based nuclear deterrent with large numbers of deployed and reserve weapons, to a deterrent consisting of a smaller nuclear

weapons stockpile with greater reliance on the capability and responsiveness of the Department of Defense (DOD) and NNSA infrastructure to respond to threats. The NNSA infrastructure must be able to meet new requirements in a timely and agile manner while also becoming more sustainable and affordable. As part of the goal of a responsive infrastructure, efforts are underway to both modernize and consolidate the facilities and infrastructure needed for ongoing stockpile stewardship from the current Cold War configuration. The Department is reviewing recommendations from the recent Secretary of Energy Advisory Board (SEAB) study of the nuclear weapons complex and is formulating a strategic plan for achieving a responsive infrastructure that includes consideration of those recommendations. We intend to communicate the elements of that plan to Congress this spring.

The FY 2007 budget request of $6.4 billion for *Weapons Activities* strongly supports implementation of the responsive infrastructure and the ongoing program of work that forms the backbone of the nuclear weapons deterrent as well as a robust safeguards and security program. This includes all programs to meet the immediate needs of the stockpile, stockpile surveillance, annual assessment, and life extension programs. NNSA uses world-class science resources along with industry and academia in the areas of computation, simulation, experiments, materials science and analysis of highly complex weapons physics information. NNSA will continue to move ahead with the *Reliable Replacement Warhead* (RRW) program to establish the path forward for stockpile transformation. Success of the RRW program will, in turn, enable transformation to a more responsive infrastructure. The campaigns are focused on long-term vitality in science and engineering and on R&D supporting future DOD requirements, and include support of the first ignition experiment at the National Ignition Facility in 2010. These 11 campaigns also represent a core investment in science and technology within DOE whose reach is felt beyond the national security arena. In addition, NNSA is implementing a responsive infrastructure of people, science and technology base, and facilities and equipment needed to support a right-sized nuclear weapons infrastructure.

Defense Nuclear Nonproliferation: Preventing weapons of mass destruction from falling into the hands of terrorists is one of this Administration's top national security priorities. The FY 2007 request of $1.7 billion strongly supports the international programs that are denying terrorists the nuclear materials, technology and expertise needed to develop or otherwise acquire nuclear weapons. The FY 2007 budget request for Defense Nuclear Nonproliferation increases by 6.9 percent the amount appropriated in FY 2006. NNSA continues unprecedented efforts to protect the U.S. and our allies from threat, including $261 million for cutting-edge *nonproliferation research and development* for improved technologies to detect and monitor nuclear proliferation and nuclear explosions worldwide. There are also major efforts focused on potential threats abroad. The budget request includes $207 million to help complete the shut down of three Russian nuclear reactors still producing 1.2 metric tons of plutonium per year and replace them with conventional fossil fuel power plants. Also, this budget requests $290 million for construction of the U.S. *Mixed Oxide Fuel Fabrication Plant* at DOE's Savannah River Site in South Carolina. This facility will dispose of 34 metric tons of U.S. surplus plutonium.

A key breakthrough in nonproliferation efforts was recently achieved with the agreement at the Bratislava meeting in 2005 to allow the United States to help Russia improve security at a number of military warhead sites. Coupled with the continuing material protection and recovery programs, *Megaports* and *Second Line of Defense*, and the successful completion of negotiations on a liability protection protocol allowing the U.S. and Russia to move ahead on disposition of surplus plutonium, NNSA is making significant strides to reduce the threat from proliferation of warheads and weapons-usable nuclear materials.

Naval Reactors: NNSA continues to support the United States Navy's nuclear propulsion systems. The FY 2007 request is an increase of 1.7 percent over the FY 2006 appropriation level. This increase allows the Naval Reactors program to develop new technologies, methods, and materials to support reactor plant design for the next generation reactors for submarines and aircraft carriers, and continue stewardship and remediation for their facilities and sites to maintain outstanding environmental performance.

Safeguards and Security: The Defense Nuclear Security program is responding to a revision in threat guidance affecting *physical security* at all NNSA sites. Meeting the new Design Basis Threat will require further upgrades to equipment, personnel and facilities. NNSA is committed to completing these upgrades. The FY 2007 budget request for Cyber Security program activities, protecting information and IT infrastructure, is essentially level with the FY 2006 funding level. The FY 2007 Request includes funding for the *DOE Diskless Conversion* initiative. Meeting the post-

9/11 security requirements has required a significant long-term investment, reflecting DOE's continuing commitment to meet these requirements.

ENSURING A CLEAN ENVIRONMENT

Just as important as advances in national security, energy independence, and scientific discovery are the Department's programs that protect human health and the environment by cleaning up Cold War legacy waste and improving management of spent nuclear fuel through the establishment of the national permanent nuclear waste repository at Yucca Mountain, Nevada. Like many of the Department's major programs, the environmental cleanup program and the nuclear waste repository activities have undergone management and programmatic reforms to further improve operations and implement effective and efficient practices.

To deliver on the Department's environmental cleanup commitments following 50 years of nuclear research and production from the Cold War, in 2002 the Environmental Management program underwent a major transformation that would enable the Department to perform its cleanup activities faster than previously estimated. Working in partnership with the public, states and regulators, the Environmental Management (EM) program has made significant progress in the last four years to shift away from risk management toward risk reduction. By the end of FY 2006, the cleanup of a total of eighty-six DOE nuclear legacy sites will be complete. This includes the recently announced completion of Rocky Flats and the anticipated FY 2006 completion of Fernald and Columbus sites in Ohio. While encouraged by the results demonstrated thus far, the program continues to stay focused on the mission and is working aggressively to enhance and refine project management approaches while addressing the regulatory and legal challenges associated with this complex environmental cleanup program.

In FY 2007, the budget includes $5.8 billion to continue environmental cleanup with a focus on site completion, with eight sites or areas to be completed in the 2007 to 2009 timeframe. This budget request is reduced from the FY 2006 budget request of $6.5 billion primarily reflecting cleanup completion at some sites in FY 2006 and the subsequent transfer of post-closure work activities. As cleanup work is completed over the next five years at sites without a continuing mission, EM will transfer long-term surveillance and monitoring activities and management of pension and benefit programs to the Office of Legacy Management. For those with continuing missions, these activities will be transferred to the cognizant program office.

The $5.8 billion budget request remains focused on EM's mission of reducing risk by cleaning up sites—consequently also reducing environmental liability—and will support the following key activities:

- Stabilizing radioactive tank waste in preparation for disposition (about 30 percent of the FY 2007 request for EM);
- Dispositioning transuranic and low-level wastes (about 15 percent of the request for EM);
- Storing and safeguarding nuclear materials (about 15 percent of the request for EM);
- Decontaminating and decommissioning excess facilities (about 20 percent of the request for EM); and
- Remediating major areas of our large sites (Hanford, Savannah River Site, Idaho National Laboratory, and Oak Ridge Reservation) (about 10 percent of the request for EM)

One of the significant cleanup challenges is the management and treatment of high-level radioactive liquid waste at the *Hanford Waste Treatment and Immobilization Plant* (WTP). In FY 2007, $690 million is proposed for the WTP project. The plant is a critical component of the program's plans to clean up 53 million gallons of radioactive waste currently stored in 177 aging underground storage tanks.

By June 2006, the U.S. Army Corps of Engineers is expected to complete an independent cost validation, deploying more than 25 professionals experienced in cost estimating, design, construction, and commissioning. The Department plans to utilize the results from several reviews to validate cost and schedule for this project.

The Department, while responsible for the cleanup and disposal of high-level radioactive waste generated from the Cold War, is also responsible for managing and disposing of commercial spent nuclear fuel in a safe and environmentally sound manner. The latter responsibility is the mission of DOE's *Office of Civilian Radioactive Waste Management* (RW).

The Nation's commercial and defense high-level radioactive waste and spent nuclear fuel will be safely isolated in a geologic repository to minimize risk to human health and the environment. The FY 2007 budget requests $544.5 million to establish a geologic repository at *Yucca Mountain,* Nevada. This Administration is strong-

ly committed to establishing Yucca Mountain as the Nation's first permanent repository for high-level waste and spent nuclear fuel. Licensing and developing a repository for the disposal of these materials will help set the stage for an expansion of nuclear power through the President's GNEP initiative, which could help to diversify our energy supply and support our economic future. Permanent geological disposal at Yucca Mountain offers the safest, most environmentally sound solution. for dealing with this challenge.

To further advance the Administration's commitment to the establishment of Yucca Mountain, the Department intends to submit to Congress legislation to address land withdrawal, funding and other issues that are important to the program's success.

As the Environmental Management program completes cleanup of sites throughout the DOE complex, management of post closure activities at these sites will transfer to the *Office of Legacy Management* (LM). In FY 2007, $201.0 million is proposed to provide long-term surveillance and maintenance, long-term response actions, oversight and payment of pensions and benefits for former contractor retirees, and records management activities at closure sites transferred to LM. The majority of funding ($122.4 million) is associated with the transfer of post closure responsibilities and funding of three major sites from EM to LM in FY 2007. These sites are: Rocky Flats, $90.8 million; Fernald, $26.5 million; and a group of sites known as the Nevada off sites, $5.1 million. The cumulative effect of these three transfers results in a 150 percent increase in the Legacy Management budget matched by a corresponding decrease in the Environmental Management budget.

IMPROVING MANAGEMENT FOR RESULTS IN OUR LIFETIME

Underpinning and supporting all of the programs above, the Department of Energy has continued to make strides in meeting President Bush's challenge to become more efficient, more effective, more results-oriented, and more accountable for performance. Over the past four years, the President's Management Agenda (PMA) has been the framework for organizing the Department's management reform efforts.

To better manage human capital, the Department implemented a performance management system to link employee achievement at all levels with mission accomplishment. In FY 2006, DOE will publish, communicate and implement a revised five-year Human Capital Management Strategic Plan as well as a formal leadership succession plan. The Department completed six competitive sourcing studies and has three others underway. The completed studies encompass over 1,300 Federal and 1,000 contractor positions with $532.6 million in expected savings. During FY 2007, DOE anticipates studying approximately 100 to 300 positions.

In FY 2006 and FY 2007, DOE will expand the availability of financial data in support of decision-making by continuing to implement the Integrated Management Navigation (I-MANAGE) system, specifically in the areas of budget and procurement through the Integrated Data Warehouse (IDW). The Department continues to apply Earned Value Management principles to each of its major information technology investments. In addition, DOE is partnering with other government agencies to develop a standardized and integrated human resources information system, and to develop a consolidated grants management system.

The Department continued its effort to institutionalize multi-year planning and strengthen the link between program performance and resource allocation decisions. The Program Assessment Rating Tool (PART) continues to be used to promote improved program performance. For programs that have not formally been reviewed by OMB, the PART process has been used for internal self-assessment.

A number of important milestones were reached in Real Property Management including the approval of the Asset Management Plan (AMP) by the Deputy Secretary. The AMP outlines an overall framework for the strategic management of the Department's $77 billion portfolio of Real Property Assets. Additionally, the 20,000 real property records in the Facilities Information Management System, the Department's repository of real property information, were populated and updated as required by the Federal Real Property Council for support of the Federal Real Property Profile. This information will be used to support real property management decisions department-wide.

As these examples indicate, the Department of Energy is using the PMA to address its many management challenges. The Department is working to become more streamlined, more efficient, and more results-oriented in FY 2007.

CONCLUSION

The Administration recognizes that energy is central to our economic and national security. Indeed, energy helps drive the global economy and has a significant impact

on our quality of life and the health of our people and our environment. The FY 2007 budget request balances the need to address short-term challenges while planning for long-term actions. The request evidences the fact that our basic science research must remain strong if we are to remain competitive with our global partners. The request contains bold new initiatives in nuclear, biomass, and solar energy. It continues the President's strong commitment to clean coal, hydrogen, and fusion. The request honors our commitment to deal with civilian nuclear waste, as well as legacy waste from the Cold War, and to further our already successful nonproliferation programs in order to help ensure a safer world for generations to come.

The CHAIRMAN. Thank you very much, Mr. Secretary.

I am going to proceed as I normally have and yield to Senator Bingaman first. But I want to welcome a new Senator. Senator Menendez, we are glad to have you. Your predecessor was on this committee. We are glad to have you. I think you will find that this is a very exciting committee. A short year, so there is not going to be as much as last year, but I think you will find it interesting. We are very glad to have you. You will also find it to be very bipartisan.

Senator Bingaman.

Senator BINGAMAN. Thank you very much.

Mr. Secretary, let me just ask about some specifics that concern me, one on efficiency. In the Energy Policy Act we authorized $25 million for a new program designed to help States adopt the latest building energy codes and to increase compliance with energy codes. There was strong support for this from various States. They welcomed this assistance. We use 40 percent of our energy in buildings at the current time in this country, so it is an important initiative in trying to help save electricity and natural gas and heating oil.

The budget that you have submitted does not include anything for this new program. In fact, as I read it you eliminate the Department's current $4.4 million building code training program. Could you explain why there is no resource for that?

Secretary BODMAN. Yes, sir. And you will hear me say this, I think, in answer to many questions. This budget does have substantial increases, as I have already mentioned, in science, in nuclear, in solar energy, biomass, and in other areas. Yet the budget itself is basically flat with last year, and that means the money had to come from somewhere. We had to make some very tough choices and decisions.

If this were a world where I could make unilateral decisions, we would probably have a much larger budget. But that is not how the system works.

I guess the other comment I would make, I would guess that your chart showing the levels of authorization and the way the budget matches up to it is probably pretty accurate. We will check on all that and make sure we give you the feedback, as I said before. But because something is authorized does not necessarily mean, as you well know, that it gets appropriated, and there is not a requirement that the Executive Branch request an appropriation.

So we have not matched up. We have tried to focus the spending and particularly the increases in areas that we feel we have a particular ability to really influence in a major way, to transform the technology and transform society in and around these commitments. That is the best I can tell you, sir.

Senator BINGAMAN. Thank you. Let me ask about your Global Nuclear Energy Partnership, and I do not claim any expertise about that at this point, but I am trying to understand it. What is the total life cycle cost of this GNEP? That is the acronym for it these days, right, the GNEP?

Secretary BODMAN. Yes, sir, that is accurate.

Senator BINGAMAN. Including the design and the construction and the operation and decommissioning of a reprocessing plant and a fleet of fast reactors? Do you know that figure?

Secretary BODMAN. I can tell you what I do know, sir.

Senator BINGAMAN. Okay.

Secretary BODMAN. This is a program that recognizes the fact that spent nuclear fuel still contains the vast majority of the energy that you started with when you use low enriched uranium, which is what is used on commercial energy reactors. The problem is it is transformed chemically. A lot of it is in plutonium and it is in other actonides, other chemical materials that are in there.

Yucca Mountain has been designed to accommodate that material, which is very toxic because it contains these highly radioactive materials. The goal of GNEP is to first recover those materials from the spent fuel that can be used to generate energy in a new type of reactor, a so-called fast reactor, but to do it in a way that does not promote proliferation. So that you would recover plutonium mixed with other actonide materials that are not useful in making a bomb.

It has been demonstrated at Argonne Labs that it works at a bench level. So GNEP is intended to produce a large-scale, engineering-scale pilot plant, if you will, to demonstrate that.

Second, we need to devise a so-called fast reactor and to build a reactor that will burn the recovered plutonium and actonides and produce additional energy. That is the second general piece of this.

We have $250 million in the 2007 budget that is intended to get us started on the engineering design of the scale-up so that we can start constructing this equipment. When you look at what the time scale is and the cost, you have very wide error bands on it. The number that you are looking for in my judgment is tens of billions of dollars. It is going to be $20 to $40 billion, something like that.

Senator BINGAMAN. The National Academy had a study in 1996 that put the figure at $62 billion.

Secretary BODMAN. Well, that is conceivable. That seems high to me, based on what I now know. We have looked at what this—and I have not looked at that study. But it is going to be very expensive and it is going to take a long time. I can say that.

So the idea is to do enough work so that we can narrow the error bands, and we can say with greater certainty what the cost will be. So that is what the goal is over the next 2 to 3 years, to be able to do enough work that we can narrow the error bands and put the President in a position to make a, if you will, a go or no-go decision as to whether this is something that makes sense.

We believe it does on the surface of it. I believe, sir, that we are going to find a lot of response, positive response, from the international community, from Britain, from France. We have visited with the people at the IAEA in Vienna. We have talked to the Russians, we have talked to the Chinese, we have talked to the Japa-

nese, and there seems to be a lot of interest. If that is the case, hopefully we can do it faster and less expensively when we look at it from the U.S.'s standpoint. That is the general idea.

Senator BINGAMAN. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Senator Craig.

STATEMENT OF HON. LARRY E. CRAIG, U.S. SENATOR FROM IDAHO

Senator CRAIG. Mr. Chairman, thank you very much. I appreciate bringing GNEP into reality. I certainly believe it is a worthy initiative and very important that we work with our world around us in addressing waste and proliferation issues. I support it.

At the same time, I think there is a reality check that we all have to deal with in it and, Mr. Secretary, I think you appropriately stated it. But I do believe it ought to be effectively combined with our next generation nuclear plants and that there is a synergy that works when you bring these kinds of talents together. I think that is going to be increasingly important, even to the point of talking integration and relationships and modularizing and doing all of those things that are very possible to do with the new technologies that you are looking at investing.

Of course, I know you had to move money around and I am not at all happy at this moment that NGNP got 23 instead of the 40 that we think is necessary to keep the project moving in the direction that it does. We will work with you on that to see if we cannot move those numbers around a little bit. I think it is tremendously important because what we do not want to fall through the crack and what is being talked about, of course, is the hydrogen side of the initiative that somehow gets missed in all of this new excitement about new technology.

I think what our country wants is to become energy independent. I know that there is a little push-back on how you define "energy independence." Why do we not challenge our country to do just that and put the science and technology behind it? Americans understand those kinds of challenges. We have met it in the past and we can meet it once again in the future.

But to suggest that 50 years out we are still going to be sending hundreds of billions of dollars abroad for the sake of our energy appetite does not make a lot of sense if that could be spent here in the kinds of technologies and new approaches we are talking about.

So I think Americans become increasingly excited when you challenge them. They become increasingly frustrated when the price at the pump goes up or the price of their space heating goes up and there seems to be no alternative to that happening. So that is a reasonable challenge that I think we need to talk about.

Yes, you moved some money around and I am concerned about the hydro and geothermal technology. We are battling a very difficult time out in the Pacific Northwest as it relates to fish and hydro systems and all of that. Advanced hydroturbine design can increase fish passage by 98 percent and still maintain the productivity of that phenomenally valuable hydro system in the Pacific Northwest, and I think that is tremendously important.

The integration that we are talking about as it relates to cellulose ethanol technology, I think Americans get that and understand it. We are on the threshold of being able to do that, Mr. Secretary, and I would hope that the focus is appropriate there, and in that focus, coming off from the energy bill of last year, please expedite the implementation of the loan programs and the guarantees that are out there that will drive that technology to the market, instead of just talking about it.

I think that is part of the frustration I am going to have and this committee will have as we examine the work we have done that we think was effective and responsible and the new work to come and the fact that what we have done does not get to the marketplace in the timely fashion that it ought to. It is obvious we cannot do everything, but I think Americans understand and are anxious.

A comment and then a question of you. I spoke of the hydro systems of the Pacific Northwest and our pride in them and the challenges they have. In this budget there is a suggestion, a proposal, that forces the Bonneville Power Administration to move its excess revenues, so defined, above $500 million into the Treasury. The one thing I have learned about Washington in the years I have been here: Very few people in this city understand and appreciate the interrelated systems of the Northwest as it relates to hydro and Bonneville. There are short water years, there are long water years. There are fish demands. There are all types of things.

Because we are able to sell surplus integrated into the system, we can spread the cost. It has allowed us to remain reasonably competitive in the world and it has kept a very robust hydro system that allows also the kind of growth that is necessary as it relates to transmission and all of that.

I would suggest that what is now in the budget is a reflection of this city's lack of understanding, if not sheer ignorance, of that system. So here would be my question to you, Mr. Secretary. Why do you not work with us in the Pacific Northwest? Why do you not set down with us collectively and the systems of the Pacific Northwest and the Bonneville Power Administration and the States related and the power council that was created out there as an oversight process, and see if we cannot address some of what you have proposed without damaging or strangling that very productive system.

Is it possible that you could do that? I think if you did that and we developed a cooperative plan for the region, it would make a lot more sense than what is just being proposed out of this budget and OMB's attitude. A question to you.

Secretary BODMAN. Of course, we would be happy to work with you—I know there are other Senators from the region who have not yet spoken, but will, I am sure, on this matter. We certainly would be pleased to sit down and discuss the matter with you.

I can say to you, if I could go back, you touched on a number of points. One of them is near and dear to my heart and that is the question of the speed with which we get things done, and let me go on the record, sir, as telling you that I have—when I took this job a year ago, I too was very concerned about how fast we were getting things done, and I have explained and challenged the program leaders in the Department that I would like to get some-

thing done in my lifetime. I am 67 years old. You can figure out what the tables are, but the number I have is 20 years in my mind. So anything beyond 20 years I do not really care a lot about, and so we are focusing on trying to get things done in a fashion and in a time scale that is prompt. So you will see that in where we are choosing to put our money and how we are putting our money.

But back to the Bonneville—and I should also mention the question on the loan guarantees. That has a very high priority in my mind, also addressing to the chairman. I meet often with our general counsel who is overseeing this, including, sir, yesterday late in the day as I got a chance to review with him where that is. I would be happy to speak to that at some other time if you would like that done. But I assure you that it has a very high priority within the Department.

On Bonneville, this is simply a proposal that I think is reasonable and it is responsible. That is what I think. That may be very different than what you all think and we would be very happy to meet with you and to discuss the matter and work through hopefully a model that would satisfy all the parties.

Senator CRAIG. Thank you, Mr. Secretary.

The CHAIRMAN. Without using my time, I just wanted to tell you, Mr. Secretary, the problem of frustration on Bonneville and that whole series in the budget of saving money by shifting some of the costs back to the payers is that every year every president puts this in, and every year every Congress says no. Now, that is government. But we get charged for it. You understand, your budget gets charged for it, which means we have a very difficult time putting the package together because we start in the hole. We start with whatever hundreds of millions you plan to save does not get saved, and so we have got to make it up first before we start paying for the programs you ask for.

So I tell you that only because you have to argue with OMB and that might be a nice argument one of these times. Of course they will not listen, but—anyway, end of statement.

Secretary BODMAN. Thank you, Mr. Chairman.

The CHAIRMAN. We are going to go to the next Senator, Senator Cantwell.

Senator CANTWELL. Thank you, Mr. Chairman. Welcome, Secretary Bodman. To follow up on that, last year when we had this discussion with my colleagues, Senator Wyden noted there had been such an outrage by Northwest members over this, that our colleague Senator Gregg basically said he was not going to put any change in BPA rates into the budget. And roughly about that same time you came before the committee.

Senator Wyden asked if the administration was not going to try to do an end run on this proposal. By that, I think Senator Wyden was saying doing something that did not require legislative changes.

My question is, because you said you did not want to do a legislative end run—I think you said: "I am just an engineer, speaking from my vantage point. I do not believe I or anybody at the Department has the flexibility of doing an end run."

So I am asking you if the administration plans to try to do this by Administrative Procedure Act and whether you are agreeing with that proposal.

Secretary BODMAN. First of all, last year, Senator, I made that commitment and we did not do that. We attempted—I tried to make the case of a legislative change that was required by the need to make a change, if you will, in the rate schedule. That is what was called for at that time. Congress in its wisdom declined to do that and that was that. So we did not attempt to make—if you will, to do an end run.

This is a different matter in my view. This is this year. That was last year, and this is a proposal that would in a very good year—that is to say, when Bonneville is able to sell power in excess of a half a million dollars net to the administration—to use those funds in excess of that, to pay down debt. It seems to me that is a standard. That is something that would be done in the private sector if one was a banker. In effect, this government is the banker for the Bonneville Power Authority. It provides the funds for it, and that when you have very good times that is the time that you pay down your debt.

So that is where my attitude is on it.

Senator CANTWELL. I am sure I could very easily launch into a speech about how the Northwest will not tolerate any kind of shifting of payment away from what has been part of the mix in reducing rates in the Northwest. But I am asking you specifically, is the administration going to proceed with the *Federal Register* notice and try to change this, which is 70 years of practice and policy in Federal law, change it by an Administrative Procedures Act? Is that the intent of the administration?

Secretary BODMAN. That is the intent of the administration, Senator. I have just committed to Senator Craig to sit and talk and listen to each of you, as well as the BPA staff themselves, before we would do anything. So we will do that.

Senator CANTWELL. You mean before a *Federal Register* notice?

Secretary BODMAN. Before anything is done, whatever it is.

Senator CANTWELL. But it is the administration's intent to move forward that way, without any legislative process?

Secretary BODMAN. That is the proposal. That is the proposal, yes, ma'am.

Senator CANTWELL. As my colleagues here will continue to articulate, I am not going to spend my few minutes here talking about the absurdity of this—because every year we go through this. I liked the way that I think an editorial in one of the newspapers in the Northwest described this: It does not matter how you dress up this pig or what kind of lipstick you put on it this year; it is still something that is not going to fly in the Northwest. And we will continue to fight it.

I wanted to ask about the President's State of the Union Address and his comments about reducing Middle East oil by 75 percent over the next 20 to 25 years. The next day you, I think, were quoted in a press roundup briefing as saying that it was just an example. So I am asking, was the President wrong in what he stated? I am trying to understand where the administration is on this goal?

Secretary BODMAN. The President was not wrong. Neither was what I said the next day inconsistent with what the President said. First of all, this is a research program and, assuming that we are successful in the research program, we will have a dramatic increase in the replacement of oil that is imported into this country from domestically produced liquids. That is the goal.

I mean, I think that falls into the same category that Senator Craig mentioned. Was the President laying out a goal that he is committed to?

Senator CANTWELL. I know my time is up. I just wanted to get a yes or no answer. So then does the administration support a national goal of reducing petroleum consumption by 4.49 million barrels by 2025? That is what it would take.

Secretary BODMAN. Yes.

Senator CANTWELL. So he supports that?

Secretary BODMAN. Who is "he"?

Senator CANTWELL. The President. The administration supports——

Secretary BODMAN. Oh, yes, yes. That is what he said.

Senator CANTWELL. It was just an example or he supports that goal?

Secretary BODMAN. He supports that goal.

Senator CANTWELL. So he will support legislation that says let us reduce this by 4.49 million barrels by 2025; the administration will send up a response saying, yes, we support that legislation?

Secretary BODMAN. I cannot say—I did not say that. I did not say that. I said that that is the goal and that was the President's goal that was articulated. Further, the President proposed a research program and an investment particularly in the biomass area, biorefining area, that we believe will get us there. So the two are linked. That is the goal and the investment that is being made. Our folks have worked on that and believe that it is possible. As I said before, there are no guarantees on this because we do not know, but we believe that it is possible that we will get there and that it is a responsible goal to lay out.

Senator CANTWELL. In that sense, a responsible goal, if it was in legislation, would be an idea if it was just a goal.

Secretary BODMAN. It depends on what the legislation is, Senator.

Senator CANTWELL. But just that concept, that concept of a goal.

Secretary BODMAN. I do not know—I do not understand. The President laid out a goal. We laid out a program that we believe will get us there. If you want me to commit here in a public forum that we will support legislation consistent with that goal, I cannot do that. I do not know what the legislation is and the means by which one would get there. And you cannot legislate that——

Senator CANTWELL. I know, Mr. Chairman, and we could probably go around and around on this. But I think my point is that we would like to see the goal in legislation. Previously, the administration has not supported a goal without the details of committing to one technology or another. But we will continue this discussion, I am sure.

So thank you, Mr. Chairman, for your indulgence.

Secretary BODMAN. Thank you.

The CHAIRMAN. Senator, look. We could set a goal, pass it here today, saying we are going to be independent of crude oil by 50 years from now. How do we get there? That is nothing. That is a statement. You want to pass that? Put it on the floor. You want to get whatever you said, a resolution that will do that? It sounds neat.

Somebody has to decide, what are you going to try to do? So you suggest that kind of resolution, we will debate it. We are going to have a series of hearings, incidentally, and bring you and anybody who thinks they have a plan for energy independence. We are going to ask them to come here and tell us how. We are going to have 2 days, bring the best in America and sit them out here and say, how do you get to independence, and let us let them tell us.

Senator Thomas.

Senator THOMAS. Thank you, Mr. Chairman. I hope we do not hear everyone who has an idea.

In any event, thank you very much.

The CHAIRMAN. We are going to have to select the best.

Senator THOMAS. Oh, I see, okay. Got you.

Mr. Secretary, glad you are here. I think we have followed quite a bit here. Our energy plan and our Energy Act that we did pass outlined a map for the future and hopefully we can implement that, and that is what we are doing, of course, by modernizing the structure and investing in supplies and so on.

But I think one of the real issues that we do have to talk about is we have to balance time. There are things we can do that are out in the future and that is research, and that will take hopefully before your 20-year time expires. But there are other things we have to do right away. I mean, we have an immediate need with respect to the cost with respect to that.

So I guess that is really what I would like to talk about, and I have several areas that I would like to mention to you. Bio and solar and all those things are great, but if we are talking about doing something in the next year or 2, why, we have some opportunities I think now. For example, you mentioned the R&D funding and I am a little bit at a loss why the administration objects to this program when 85 percent of the benefits are for small independent producers.

Now, we sometimes say, oh, we have got all this profit there, the guys can do their own research. 60 percent of the production is small independents that are not in a position to do that. So we need to focus on significant resources to develop technologies to do that, and this budget does not continue the R&D on the short term and I wish you would comment on that, please.

Secretary BODMAN. Yes, sir. A similar response as I gave, I think, to a similar question last year. At these high prices, it is the position of this administration that there is plenty of incentive for people to drill wells and produce oil and gas. It is as simple as that.

Tough choices had to be made. Look, I understand and I have dealt with some of the independents that you referred to and have great respect for them and for the people that are involved in that industry. We had to make tough choices in doing what we did.

Senator THOMAS. I understand.

Secretary BODMAN. So it is an industry that is benefiting from current very high prices. It is a mature industry——

Senator THOMAS. Well, I remind you again that the independents do a lot of this, and the independents are not in a position to do these kinds of things. If you are talking about fairly short-term return on oil shale, for example, and the new deeper wells and those kinds of things, why, we have some opportunities in my State where we are doing research, and we have been doing research. And now this budget tends to cut it.

Let me tell you that another one that is immediate is, our greatest fossil resource is coal. The most useful thing that we have for variable uses is gas. So we have some real opportunities to make some conversion. We have some private people in the industry ready to do some of those things, but they need some financial assistance. So I am not talking about FutureGen. I am talking about doing something in the next 2 or 3 years to convert coal to gas. Yet not much support for that in this budget.

Secretary BODMAN. That one, sir, I think it is fair to say has suffered from a backlog of—a lot of money, I think a half a billion dollars, has been put out into that program over the last several years, and the money has simply not been spent in many cases. So when we went through the analysis and looked at the budgetary implications and looked at the fact that we had budgeted, we had asked for appropriations, we had received appropriations, we had spent the cash, and the various winners of these projects have not been able to spend the money effectively, that is what caused the reduction, that we would pause a year and work on getting the backlog worked out and get progress, either progress made or make a determination that some of these things were not going to work and get the money back so that we could put it elsewhere. So that is the reason.

Senator THOMAS. Well, there are plants pending, actually——

Secretary BODMAN. That is the background for it.

Senator THOMAS [continuing]. In our State that are ready to go on the thing, and I think you need to take another look at it.

Another one of course is simply the clean coal technologies, which have been struck out in this bill. Clean coal technologies, we talk constantly about the need for coal. We talk constantly about global warming and so on, and here is one of the things we need to do. I notice in the energy bill that it is zeroed out.

Secretary BODMAN. That is what I was referring to, sir, in terms of the backlog that has been there. It is in the clean coal area.

Senator THOMAS. Clean coal and conversion to gas are two different things.

Secretary BODMAN. I understand that, I understand that. I was in error and so I apologize for that. The conversion to gas, going back to the question that you had asked before, is simply a priority. We cannot do everything and so this is what the process produced as a balance between where we think the real impact can be from this Department. I cannot say anything more than that.

Senator THOMAS. Well, I am going to continue to work on it. I just urge that we try and balance this long-term work, which is very important, with 5 years from now, which is very important. We get all mixed up in this technology of stuff that is going to hap-

pen 20 years from now. We better think a little bit more about how we are going to provide our resources 2 years from now.

So thank you, Mr. Secretary.

Secretary BODMAN. I take your point, sir.

The CHAIRMAN. Thank you very much, Senator.

Now we are going to go to Senator Wyden.

Senator WYDEN. Thank you, Mr. Chairman.

Mr. Secretary, reducing dependence on foreign oil to me is about promoting national security. Because I cannot see anything in your budget proposal that reduces the dependence any time soon, I consider your proposal the equivalent of putting up a white flag of surrender on a national security priority. Let me just ask you specifically about what you would do to get people into cleaner trucks and vehicles any time soon? Senator Domenici knows I offered a proposal in the conference to bump up CAFE standards just one mile a gallon, just one mile a gallon for each of the next 5 years. Now, that is not your Department, but you tell me about your Department. What are you actually doing to get people into cleaner trucks and cleaner cars in the next couple of years?

Secretary BODMAN. Senator, you and I hold a different view on the value of what it is we are doing. I can tell you that specifically there is a provision for new clean diesel fuels that will be made available and diesel-driven vehicles, diesel-powered vehicles, are also being made available, that will allow our consumers to buy vehicles that will increase gasoline mileage 10-plus miles per gallon and produce very clean and much more efficient——

Senator WYDEN. Mr. Secretary, that and others are research programs. You have got a number of research programs——

Secretary BODMAN. Excuse me, sir. This is not a research program. This is something that is happening today. The vehicles are being manufactured today and provision is being made as we speak for getting the clean diesel fuel distributed throughout the country. It is not a research program.

Senator WYDEN. I will just tell you, I have looked at the budget, Mr. Chairman. It is a shell game. You have got research down the road, but in areas that would make a difference, for example the vehicle technology program, those are not seeing any real focus. It is a shell game. You have got a little more for research, but things that will make a difference and get cleaner trucks and cleaner cars out any time soon are not there. There is no there there, and that is why I say we are not getting the reductions in dependence on foreign oil. As you know, the Energy Information Administration has said essentially the same thing that I am saying.

Now, with respect to Bonneville, I think Senator Craig and Senator Cantwell were very diplomatic. I consider this government loan-sharking. I mean, essentially if you cause somebody to pay more in fees just because they make more money, that is in my view loan-sharking. So what I am going to do—and I appreciate the fact that we are now going to have some discussions and all the rest. But I am going to do everything I can to get into the appropriations process a requirement that restricts the use of any funds to implement this proposal.

In my view, I consider this a clear administrative end run. This is exactly what we went over last year. What you are saying is that

was just a commitment for then. Frankly, if you had told me that, Mr. Secretary, I would have tried to block your appointment on the floor of the U.S. Senate. I thought that that was something that was going to be a longer term commitment rather than just for the year. So I do consider it an administrative end run. I am going to do everything I can as one Senator working with colleagues to put in appropriations language that bars the use of any money for that implementation, because I think it is exactly what you said you would not do.

Secretary BODMAN. You and I disagree, sir.

Senator WYDEN. Thank you, Mr. Chairman.

The CHAIRMAN. You spoke of other Senators being diplomatic. I would just tell you, a diplomat you are not.

[Laughter.]

Senator WYDEN. We have strong views in our part of the world when somebody tries to slip us some economic poison.

The CHAIRMAN. One time I was over in Central America with Kissinger and another group of people, and I had a particular complaint against a former Catholic priest who had converted and begged us for money, and we gave him money, us Catholics. We were in a room and I decided that I would break the tradition, Kissinger is the only one supposed to speak. I spoke. I gave this guy unadulterated you know what.

On the way out Kissinger said: "A Senator you are. A diplomat you are not."

[Laughter.]

The CHAIRMAN. I was just mentioning that. It might fit here today.

Who is next? The Senator from Alaska.

Senator MURKOWSKI. Thank you, Mr. Chairman. I will try to be diplomatic this morning. It is nice to hear the conversation, the talk about energy independence, how we are going to get there. I might remind all of my colleagues that we had an opportunity to focus on the domestic production side just about a month ago with the ANWR vote. We do not have that in front of us.

I thank the Secretary for being here this morning. I thank you for your efforts to make sure that in the President's budget the ANWR revenue figures are included in there and included at an increased level reflecting the higher price of oil.

I also want to thank you for including in this budget the funding, full funding for the natural gas pipeline project that we are trying to get moving forward. You have got funding in there for the Office of Pipeline Coordinator and the funding to start the implementation of that loan guarantee when this project moves forward. So I want to diplomatically thank you for the things that are very, very important to the success of that project.

Now, we cannot have you sitting in front of us without being critical of some of the aspects of the budget, so we must move to that side of it. The defunding, if you will, of the oil and gas research programs—and this was mentioned by Senator Thomas. In reading the background that you have and listening to your testimony this morning, you basically say that because of the high price of oil and gas these can stand on their own.

But I might remind you of some of the incredible opportunities that we have with gas hydrates. This is an area where it is only going to be through our research that we are going to be successful in developing incredibly huge reserves of gas, not only in Alaska but around the country. This is something that Senator Akaka and I have worked on together with our legislation last year. We have got to have that emphasis. This is not going to be something that the gas companies on their own are going to be moving forward with. The incentives have got to be in place there.

So I need to know that you understand the importance of this and that you are willing to work with us in this area of gas research as it relates to the gas hydrates, and would hope for a positive comment from you on that.

Secretary BODMAN. I recognize the importance of the issue. I recognize the importance of it technically and I recognize the importance of it to your State. All I can tell you is that I am happy to talk about any subject with you at any time, but what I cannot do is to commit to changing what the President has proposed in terms of the budget. If this is a position that the Congress chooses to make a change in and the President chooses to sign it, then I will do my very best to make it become a reality.

But in terms of my changing here in this forum what has just been proposed by the President, I cannot do that.

Senator MURKOWSKI. We will look forward to the conversations, not only on the opportunities for gas hydrates, but again to go back to the point that has been made by others, in an effort to get us to that goal of energy independence, the effort to get us to the President's goal of reduction on foreign sources by a full 75 percent, we have got to provide for the incentives in these other areas.

Geothermal funding has been zeroed out. The Ocean energies, opportunities there have been funded. The hydro, as Senator Craig has mentioned. We have put great emphasis in this budget on the American Competitiveness Initiative, something that I fully support. What we are doing here is we are saying, okay, we are going to train the scientists, the engineers, we are going to make sure that we have got the best and the brightest. But we get these wonderfully educated people and they get out there and they have got no support for these brilliant projects that they are ready to move forward on.

So it has got to be something that is a cooperative effort. We have got to have the brain power, the intelligence and the projects. But we have also got to be willing to commit to some of these areas that might be construed as a little more radical. I do not think geothermal is radical. I do not think ocean energy is radical. I do not think gas hydrates is radical. This is the direction that we have got to go, and I say that coming from an oil and gas producing State.

So I want to work with you on these technologies that I think are going to be what moves this country forward.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much, Senator.

Now we are going to go to Senator Akaka. He just came back, but everybody should know he was here before. That is why you are next.

Senator AKAKA. Thank you. Thank you very much, Mr. Chairman.

Mr. Secretary, it is good to have you here this morning. Mr. Secretary, my question is on the details of the proposed increase for the biomass and biorefinery initiative, I must say a welcome increase of $59 million for alternative and renewable sources of energy, and I look upon that as a good start.

My question is, will the biofuels initiative include cellulosic biomass, such as bagas from sugar, sugar cane, pineapple, or other crops which grow in tropical regions in Hawaii, Florida, and Puerto Rico, and parts of the Gulf? Will these be included?

Secretary BODMAN. Sir, specifically these increased funds will enable us to broaden the feedstocks—that is how I think of these materials—to the process. Prior to that, with the funding level that we had before this year, in 2006, we were only able to do the work on what is called corn stover, which is the material that is left over after you grow the corn and you remove the corn kernels from the cob. So it is the cob, it is the stalk, it is the leaves. That is corn stover.

With this increased funding, we will be able to investigate and develop approaches for all of these materials you just mentioned, as well as other materials, switchgrass for example.

Senator AKAKA. Biorefineries, do you anticipate one or more demonstrations? My question really is do you see an opportunity to locate a biorefinery in Hawaii?

Secretary BODMAN. We have not gotten to the question of where we would locate biorefineries. I think it is fair to say, sir, that we first have to make a determination at a pilot scale—and this work will be done out at the National Renewable Energy Laboratory, NREL, out in Colorado. Assuming that we are successful in developing the processes, developing the microbes that could be used to undertake this reaction, we would then be in a position to work with the private sector and those companies that—because we do not build biorefineries, or at least it is unlikely that we will. We could provide some loan guarantees, I think, along the lines the chairman has expressed interest in, for such equipment and processes.

In that case, we would be working with an entrepreneur or a corporation that would take the lead in it and we would provide some financial support. So it would really be a question of where they wish to put it and what I do not want to do is make a commitment to you that I cannot honor.

Senator AKAKA. Well, I look forward to working with you on this initiative.

Secretary BODMAN. Likewise, sir.

Senator AKAKA. According to a recent report from your agency, Mr. Secretary, the Offsite Source Recovery Program has made significant progress in clearing the nationwide backlog of greater than class C low-level radioactive sealed sources that pose a threat to pubic health and safety or security. I want to thank you for your effort and commend your staff for their hard work in this.

The same report, however, indicates that the Environment Management Office has yet to designate a permanent disposal site. So my question is, can you update me on the status of these efforts

and provide me with a time line for the establishment of a permanent facility? You may do that in writing if you wish or with your comments here.

Secretary BODMAN. Well, I will ask to do it in writing. What I know about the situation, sir, is essentially what you just said. We have made good progress in identifying sources of nuclear materials that are isolated, they are orphans, if you will, and to go get them and to retrieve them. The retrieval is done, but then where do we put them? We have some choices now and eventually we would like to be able to make a determination, and we are now working our way through the environmental processes, the impact statements, and looking at a number of different sites.

But I would be happy to get you something more specific in writing, sir.

Senator AKAKA. Thank you so much.

Mr. Chairman, my time has expired.

The CHAIRMAN. Thank you.

Senator Martinez.

Senator MARTINEZ. Thank you very much, Mr. Chairman. I appreciate your hearing this morning.

Mr. Secretary, welcome. Having come to the Congress with a budget as a Cabinet member before, I have got to assure you, it is a lot more fun on this side of the table than it is where you are today.

I want to pursue this issue of biofuels as well. The State of Florida, of course, is a big sugar producer. We are vitally interested in the role that Florida can play in assisting in lessening our dependence on foreign oil. I really applaud and welcome the President's remarks in the State of the Union along these lines. I, having traveled again to Brazil recently, I continue to be fascinated by the progress that they have made in the area of ethanol production and lessening their dependence on oil.

I want to just ask you your thoughts on how we can assist the President's goal of lessening our dependence with an aggressive utilization of biofuels and the role that—pursuing the question that the distinguished Senator from Hawaii asked, how can we get this going? How do we pursue? By the way, my concern is also on the distribution system for ethanol. There have got to be gas pumps that have it and cars have got to be made that are flex-fuel cars, all of which I think can happen. I just wanted to ask your assessment of where we are on that and how we can get this to happen in a short time frame.

Secretary BODMAN. I think you will find the President is going to be quite outspoken and vigorous in providing leadership on this front, certainly for ethanol. The use of sugar cane, sugar cane and the recovery of ethanol from sugar, is one of the least expensive ways to produce ethanol. I think you are aware of that.

Senator MARTINEZ. Right.

Secretary BODMAN. And so that process technology exists and is in use, in full use in ethanol—or in Brazil, among other places, right now. I think the question is how much sugar can we produce and where and that sort of thing. I think also we are looking at the use of less expensive feedstocks, the bagas that Senator Akaka mentioned, the switchgrass, the corn stover, the materials that, if

you will, are byproducts of manufacturing a foodstuff, or it is just, in the case of switchgrass, it is a weed, if you will. It is something that has not been—we have not found a use for, but appears to be a potential good source.

The money that has been requested and that we hope is appropriated will be directed to developing a process for these less expensive fuels. In terms of using the process for sugar cane, that exists. That is there and I do not think there is any role that we can particularly play. Perhaps loan guarantees or some such thing along that line to stimulate it would be an appropriate approach. But in terms of the process development, understanding the chemistry, that is already done.

Senator MARTINEZ. Right, I know that is there. But I think the cost of producing it and bringing it to market, I think there is a role for the Department to play in—frankly, I do not know that there is a commitment from oil companies to start putting an ethanol pump or increasing the mix of the ethanol into their fuel or whatever. So I think it is going to take some role from the Department to encourage production with guaranteed market access and so forth, because I do not think otherwise it will happen. Plus there may be also a need for there to be encouragement and governmental assistance in terms of driving down the cost of producing it, at least in initial phases.

Secretary BODMAN. That is what the intention is of this effort, namely driving the cost down so that we can produce ethanol at a cost that is superior to that which we have from gasoline.

The other issue is how do we modify the automobiles. Automobiles have to be modified in order to accept ethanol blends.

Senator MARTINEZ. Right.

Secretary BODMAN. It is not a very expensive process. It is $100 a car and that price seems to be declining with time. So I think you will find this year I think it is General Motors is going to manufacture and make available half a million vehicles and Ford I think a quarter of a million.

Senator MARTINEZ. Ford and GM are making these vehicles in Brazil.

Secretary BODMAN. I understand.

Senator MARTINEZ. For the Brazilian consumption.

Secretary BODMAN. But they are also going to be made available here.

Senator MARTINEZ. And again, the technology is there. There is nothing to invent there.

One other question. I know that we have had a tremendous spike in gas prices. The State of Florida forecasts, the energy office, that there will be a 30 percent increase, along with a 30 percent expected increase in bills over the next several years. And I believe we have had an overreliance on natural gas for power generation. Would you agree with that? And if so, how do you see the role of the Department in moving away from such an overreliance on one fuel source, which has in fact had the effect of increasing the price for other users of gas? And would you also agree that it is a terribly inefficient way to generate power?

Secretary BODMAN. I would agree with everything you have just said, Senator. It is a very—using natural gas to generate energy—

I have used this analogy in public before; I guess it is all right to say here—is like washing your dishes in good scotch. It is not a good use of the material and from a chemical standpoint it is terrible.

So more and more power generation is done using natural gas because it is clean and it does not produce greenhouse gases in nearly the degree that oil or coal does.

Senator MARTINEZ. And it was very inexpensive.

Secretary BODMAN. And it was very inexpensive. And what has happened is that we have seen a huge shift in price. We now have some of the most expensive natural gas in the world in this country, in part because we have not yet been successful in getting Senator Murkowski's natural gas pipeline built, but we are working on that. And in part we do not avail ourselves of liquified natural gas.

So both of those—the LNG has been dealt with in the energy bill and we are seeing a lot more interest in importing liquified natural gas. So I think it is a matter of we better find ways to increase the supply. If Secretary Norton were here from the Interior Department, she would tell you that she is working very hard on increasing supply from various Federal lands that are available that can be drilled, and so they are working on accelerating the processing of applications and so forth. So that one is a matter of getting the supply up and at the same time providing electricity through other means, which should be nuclear, nuclear or clean coal, one of the two.

Senator MARTINEZ. Clean coal and nuclear.

Secretary BODMAN. Yes, sir.

Senator MARTINEZ. I think I am going to quit while I am ahead, Mr. Chairman. I see you lining up for me.

The CHAIRMAN. We are going to quit because you used too much time, not because you were ahead.

Anyways, we are going to have our new Senator next. Thank you.

Senator MENENDEZ. Thank you, Mr. Chairman. Let me thank you for your warm welcome to the committee and I look forward to working with you and Senator Bingaman and all of our colleagues on mutual goals. I appreciate the Secretary being here on a budget that is incredibly important to the Nation and to my home State of New Jersey.

Mr. Secretary, I was pleased to hear the President speak last week of ending our addiction to oil, reducing our dependence on foreign imports, and devoting additional resources to research into renewable energies and alternative fuels. It is one of the moments I stood up and applauded.

But I was not pleased when I saw the President's budget this Monday, because it appeared to me that the request does not match the rhetoric. Instead of a new age-type Manhattan Project to break our dependence on foreign oil, we got baby steps such as a 22 percent increase in the renewable energy research budget. That is a worthwhile step, do not misunderstand me, but it pales in comparison to the past energy bill, which gave a great bulk of the Nation's collective resources to traditional energy sources. So I am somewhat disappointed in that.

I clearly believe that the country needs a comprehensive energy strategy, one that advances technologies to make energy safer, cleaner, and less expensive, and taking real steps, real steps, to increase national conservation. I again appreciate hearing both the President and yourself talk about the importance of conservation and energy efficiency. But the budget contains big cuts for energy efficiency programs and research. It seems to me at a time of record high energy prices, when we are trying to break the very addiction the President talked about in his speech, it does not make sense.

One of them particularly I want to ask you about is the weatherization program. I hope you could answer a few questions for me just to make sure I have got this right. How many homes has DOE weatherized through our weatherization program?

Secretary BODMAN. I will try to find out, sir.

Senator MENENDEZ. I have got some numbers here. Maybe if I throw them out you might agree or disagree with them. I have got a little over 5 million homes. Does that sound about right?

Secretary BODMAN. That sounds high.

Secretary BODMAN. Senator, the numbers are: in 2005 we helped weatherize 92,000 homes. In 2006 the number is 97,000. And, consistent with the 2007 request, it is 64,000.

Senator MENENDEZ. Well, I was referring to since the beginning of the lifetime of the program. I have information that it is over 5 million homes. And how much in savings do we get on average?

Secretary BODMAN. I do not have the numbers offhand. I can tell you that the cost—it is not a particularly good rate of return.

Senator MENENDEZ. Well, let me read to you what the Oak Ridge National Lab said. They said that weatherization programs reduce annual energy bills an average of $235 per household.

Secretary BODMAN. Right.

Senator MENENDEZ. They said over the life of the improvements the total benefit-cost ratio is $3.71 to the dollar spent by the Federal Government. That is not a good rate of return?

Secretary BODMAN. Not over the 25 years, sir, I do not think that you would find that it is. I mean, I think that is what it is—it is an 8 percent rate of return, something.

Senator MENENDEZ. Well, let me ask you this. It saved 15 million barrels of oil a year. Is that not a good rate of return?

Secretary BODMAN. The amount of oil that has been saved is a question that one would have to investigate in terms of—if you have converted the amount of energy that has been saved into barrels of oil—and fortunately, that is not how we are heating our homes.

Senator MENENDEZ. Well, if you look at last year's budget under the weatherization program, it was listed as supporting a compassionate society.

Secretary BODMAN. Yes, I think that is fair.

Senator MENENDEZ. Does this year's budget indicate then, with the significant cut that this has received, that we are no longer supporting a compassionate society?

Secretary BODMAN. This is a matter, sir, of trying to make judgments on the availability of funds that I have access to. I personally made this decision as it came across my desk and it was strict-

ly—it was strictly knowing how much money I had to spend and where I had to put the funds. This was one that, as painful as it is—it is not a question, you see, at least in my view and I am sure you would agree with this, it is not a question of what the rate of return is. It is a question of people are cold in the winter, and no amount of money is going to pay for that.

The Department has a program and we have done our very best to fund this amount that is proposed in the program, but no more. I do not know what more to say other than that.

Senator MENENDEZ. Let me just close, Mr. Secretary, by saying that the people in New Jersey—and I think this is replicated across the landscape of the Nation—who are the recipients of this are the people who are on the lowest levels of economic opportunity for our society. In my home State the overwhelming number of people who use this weatherization program are the elderly, they are poorer families with children, they are the disabled. They are the least capable of meeting the energy needs and they will be colder if we do not have the type of robust weatherization program that we should have.

So I hope that as we move forward we can look towards trying to work to reconsider these cuts.

Thank you, Mr. Secretary.

The CHAIRMAN. Thank you very much, Senator.

Let us see. We are going to go back to our side here. Senator Burr, you are next.

Senator BURR. Thank you, Mr. Chairman.

Welcome, Mr. Secretary. Mr. Secretary, I would like to thank you for being the first one in the administration to tell us what the definition of "switchgrass" was. I may be the only one up here that did not know and I have been curious, and I would have looked it up today if you had not told us.

Secretary BODMAN. The question is what is switchgrass?

Senator BURR. You shared with us what the definition was. It gives me great hope that collard greens might now be part of the mix for ethanol because we have got a lot of that in North Carolina.

I want to congratulate the administration for what I think is leadership at a very tough time as it relates to energy policy. There is no initiative that you could come out with that every member could not find one or two pieces that maybe do not suit them, but on balance I think that you have displayed the leadership that we need to move forward, become more domestically dependent, and we need to accelerate our advances.

Which brings me to R&D. I want to encourage the agency to make sure that the R&D money that we devote in this budget and I think Congress will ultimately devote challenges the private sector and not just Federal agencies on innovation, that it truly is seed money at the academic institutions around this country that really can help stimulate that math and science effort that we are attempting to stimulate on the education side.

One troubled area for me in the budget is the call for a 10 percent increase to the budget for the permanent storage site at Yucca Mountain. I think at a time where I know this chairman has raised the flag on whether we should begin to look at other options other

than permanent storage, I would suggest it is the wrong time to talk about an increase to the permanent storage site. I think we need to continue the advances on the transportable canisters and some of the other things that clearly are in the best interest. But this might be a period in time where we look at level or possibly even reductions since I happen to be one who believes that that site will not in my lifetime be used as permanent storage and hopefully the technology will provide us an option other than storage there.

My question today deals with the act that we passed last year in August, which included a 1.8 cent per kilowatt for the first 600—excuse me—6,000 megawatt production tax credit for nuclear. The Department of Treasury is responsible for actually producing the rules and the regs for the program that we established. Will you work with the Treasury Department, will the Energy Department work with the Treasury Department, to make sure that that program is structured correctly and timely to make those new nuclear plants a reality?

Secretary BODMAN. Yes. We are doing it. We have been doing it. Our folks are the primary advisers to the Treasury as they are working their way through the provisions and we are doing our best to stimulate a rapid response from the Treasury.

The CHAIRMAN. Senator, what was your question?

Senator BURR. My question dealt, with the Energy Department work to push the Treasury to make the—to write the regs in the right way and to do it in a timely fashion to implement the 1.8 cent per kilowatt tax credit for nuclear plant construction.

The CHAIRMAN. Okay, thank you.

Senator BURR. I happen to have two plants, two companies, that are considering nuclear. I think, Mr. Secretary, you know that until those rules and regulations are written they cannot move forward. Nuclear construction is a lengthy process. It is something that we need today, but it is going to be tomorrow before we can do it and a delay in the regs, a delay in the rules, means a delay in construction.

Secretary BODMAN. I am reminded of that often, sir, and I do my best to remind our legal staff of the same.

Senator BURR. Thank you.

Thank you, Mr. Chairman. I would yield to you the balance of that time.

The CHAIRMAN. Thank you.

Senator Talent.

Senator TALENT. Thank you, Mr. Chairman.

Senator Burr, I think I define "switchgrass" as the place where your golf ball ends up when you hit your usual slice off the tee. It is in the switchgrass.

[Laughter.]

Senator BURR. Not after the Rules Committee gets through with us.

[Laughter.]

Senator TALENT. Thank you, Mr. Chairman.

I appreciate your being here, Mr. Secretary. I want to associate myself with the remarks that have been made, I think by Mr. Thomas in particular, about coal. Sometimes we tend to miss the

obvious for the more exotic. Coal continues to be the default fuel, as you know, particularly for the production of electricity. As we develop the various clean coal technologies, it really holds promise, not just for the direct production of energy, but also coal gasification. I am concerned also about some of the budget proposals regarding coal. I just want to register that with you.

I want to associate myself with your remarks on renewables and just say to folks that we are in a renewable world. I agree with what the President is wanting to do. With the energy bill last year, we moved into a renewable world and people need to get ready, because in the next couple years most of the consumers, the driving consumers in this country, are going to be at least having an option of an ethanol blend, E10, and many, many millions of people are going to have a practical option of E85.

We just doubled the number of stations in Missouri pumping E85. That means today, given the normal price of ethanol, that is about $1.75 a gallon, so we are there. I think as people become more and more familiar with it they are going to want to go further, and I would just encourage you to move in that area.

A couple of things in terms of questions and maybe I will just note them for you. The budget proposes to cut the Office of Electricity Delivery and Energy Reliability by $37 million. Now, would you tell me the impact that this may have on identifying electric transmission corridors and getting the transmission built? I thought that was a key point of the energy bill. That seems to me an awful big budget cut, given the job that that agency is going to have to do.

Secretary BODMAN. I can answer that, if I may.

Senator TALENT. Yes, and then, okay, then I will ask the second one. Go ahead.

Secretary BODMAN. It will have no impact on it. That is a very high priority matter. We have merged two offices together and managed to produce a more efficient operation. That is the largest part of the operation. We have also completed some projects that we were involved with before, and those are the two reasons for it. I expect them to be quite vigorous in the siting of new transmission corridors and also working with the tribes in the West. I know that there are issues related there and they are also fully on top of that.

Senator TALENT. Okay. So you feel confident then that this agency can carry out this responsibility at the lower dollar level? You have looked at it personally?

Secretary BODMAN. Yes, I have, and I do.

Senator TALENT. Also, I cannot resist, since you discussed natural gas, I think with Senator Martinez, and I certainly agree on the need for LNG, I cannot resist asking your opinion about opening up Lease 181. I know it is not your decision. It is a different part of the Cabinet. But you are talking about 5 trillion cubic feet of natural gas. The pipeline is already there. We could be recovering that within, what, 1 or 2 years. I cannot think of a better signal now to send to this hard-pressed market. I wanted to know if you want to offer an opinion about that subject.

I will just say that the inability in some quarters to recognize the connection between price and supply—I do not know, with great respect to people, how to respond when people do not—act like there

is no connection between supply and price. Certainly other things affect price. Obviously we have a supply issue with natural gas. We have to have more natural gas. This is the quickest way to get more on line.

Would you want to offer an opinion?

Secretary BODMAN. Well, the Interior Department yesterday proposed an expansion of access to the offshore Outer Continental Shelf and starting to move into the eastern Gulf of Mexico. Having looked at the figures that they believe are there, that will at least directionally move us in the proper direction.

Also, obviously the State of Virginia has also offered up that they have an interest in it. So we are starting to see more States I think participating and I find that a healthy and positive development.

Senator TALENT. Well, and I know that there are local concerns. Missouri is a long way from the Gulf of Mexico, so it is easy for me to say that those concerns should not prevail in this instance. But I really think that we ought to be able to satisfy them.

I just hope that you, with your portfolio, will do everything you can within the administration to find a way to get this done. I am a huge advocate for alternative sources of energy and renewables. I was one of the leaders on this committee. But this is just to me such an obvious thing to do and obviously so good for the economy, and it would send the right signal. I hope you will keep working this issue, Mr. Secretary.

Secretary BODMAN. You may be certain of that, sir.

Senator TALENT. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Talent, might I say on that issue of Leasehold 181, I want to thank you for being the original co-sponsor of the legislation that was introduced yesterday. You did not state that, but I want to state it.

Senator TALENT. I thought the conversation that I just had with the Secretary might interest you, Mr. Chairman, and I sure thank you for your leadership and your work on this. I know how strongly you feel about this.

The CHAIRMAN. I know everybody gets all excited about what we are going to do to adjoining States, but, just so we get it right, the closest that leasehold is to anything in Florida is 100 miles, and it also excludes anything that the military said they might need. Still, Mr. Secretary, what is left will produce 5 trillion cubic feet, 10 million houses for 6 years, one-fourth the entire use of American natural gas per year, that leasehold. Not so difficult to say we should do it; politically very difficult nonetheless.

Let us go to Senator Smith, I believe; is that correct? Or who was here next? I am very sorry. Do we have it right, Barr, Talent, Smith, Alexander.

Senator Smith.

Senator SMITH. Thank you, Mr. Chairman.

Mr Secretary, welcome. It is good to have you here. I know I will be repetitive with my Northwest colleagues. First of all, let me say that you are not the first administration to propose these kinds of things. Ever since I have been a member of this committee, now nearly 10 years—President Clinton proposed these kinds of things and now President Bush is. It seems to be an easy target at OMB to start a budget cycle with these kinds of proposals.

What it misses, though, is a whole lot of history and a lot of water that has gone under the dam, the dams of the Pacific Northwest. We are still paying for these Federal assets, our ratepayers are, and our economies are frankly built on hydropower. They are tremendous national assets and the region of the Pacific Northwest is inseparably connected to them.

The proposal the administration has included this year, while somewhat different than last year's, nevertheless puts us in a position where we simply have to oppose. It is a fact that since the energy crisis on the west coast our rates have gone up 46 percent and they remain that. Notwithstanding that, in the interim we have worked very hard on environmental things to mitigate environmental consequences to fish and to find savings in BPA that can lower these tremendous price spikes in energy.

Your proposal simply would undo all of that. We are not in arrears. We are meeting our commitments economically and environmentally. And this throws a real wrench in the works.

I understand the need to put forward a budget that looks fiscally responsible and all of that, but we have to oppose.

I think if the administration's position is that it can do this administratively I simply have to say that that is inconsistent with statute. Under the Transmission Systems Act of 1974, the BPA Administrator is to set rates at the lowest possible level consistent with sound business principles and they are to be set taking into consideration all revenues in order to repay bonds issued by the Federal treasury as they come due.

Earmarking a portion of BPA's revenue sets, I believe, a terrible precedent and fails to take into consideration the ongoing uncertainty surrounding river operations for fish, the appropriate level of carryover reserves so we can stay current, or BPA's ability to meet its scheduled Treasury payments.

I just reiterate this because I want you to know why we will so vehemently and unitedly oppose this. We have to. Unemployment rate in my State is falling, but it is still nearly double the national unemployment rate. We cannot take any more. And energy is at the heart of any economy. If somebody does not produce power, others do not have jobs. It is just that simple.

Whether it was wise or not to be set up in this fashion in the beginning, historians and economists can debate that. But it was set up in this fashion, and too much has been built up around that, that it is our duty now as Northwestern Senators to protect. It is just that simple.

So I guess I am asking you, are you going to pursue this administratively and do you think you can win this legally when the inevitable court challenges occur?

Secretary BODMAN. I do not know. I mean, I do not know that we—the President proposed it, therefore we will do our best to cause this to happen. If there are legal impediments, if it is illegal, I have not asked that question personally. So I do not know the legality of it and whether this would survive the inevitable court challenges, as you described it. So I simply do not know the answer to that question.

Senator SMITH. Well, I would hope that it would not be done administratively. Let us work with you. But please, will this adminis-

tration, as I begged the previous administration, understand there is a lot of history here. There is a lot of people that can be hurt by the proposals that I have seen every year that I have been a member of this committee.

Thank you, Secretary.

Secretary BODMAN. Thank you, sir.

The CHAIRMAN. Senator, prior to your questions the Secretary has committed here publicly to meet with all of you from that area who are interested to discuss the issue in detail. I assume by then the issue will be better briefed and can be proposed and perhaps the Secretary will be in a better position to respond to the very precise question of why do they think it is legal.

Let me suggest, it has been suggested that this would be done administratively heretofore and it never got there. So I am not sure that we have to do something, if that is the will of the Congress. But if there is a majority, we will find a way. I am not saying there is a majority. On this committee we cannot report the President's proposal. They know that. There is not enough votes here for that.

Some of you stay on this committee forever.

Senator SMITH. There is a reason, Mr. Chairman.

The CHAIRMAN. I understand. You stay here because of this issue. You have a lot of issues, but anyway, nice to have you on board.

Senator SMITH. Thank you, sir.

The CHAIRMAN. Senator Alexander, we have imposed on the Secretary to remain with us until 11:45. Is that correct, or did you want to leave before then?

Secretary BODMAN. No. I am here, sir, at your pleasure.

The CHAIRMAN. We are going to get through on time. I have not asked any questions. Could I proceed and then you and then if Senator Cantwell wants another round we will try that.

Mr. Secretary, I am going to first, because I yielded my time, although I have put in my two cents here and there. There are a lot of people that are asking what did our Energy Policy Act do. I already told everybody that the planned nuclear power plants, that is consortia or individuals that are at the Nuclear Regulatory Commission saying we have a site, we are planning, has reached 19 as of today. Now, that is from zero to 19.

You have one thing left to do to get ready and that is to draw the guidelines for the insurance in the event of regulatory delay. It is terrific that we have done this. I want to tell you, I have been to France, where all have been assembled from around the world, and even though we are not going to compete in numbers of new plants even if we succeed with somebody like China—they have seen the light; they are already on a line to maybe have 20 and theirs may be bigger than 1,000 megawatts. We are sort of saying one. That is like the model, maybe a little smaller even. So that is one big item.

But people say, why so much emphasis on nuclear? Well, not so much. It is just that we better get going. But you know, this bill is going to increase wind energy during the period of the credits that we put in that bill such that wind is going to produce 14,000 megawatts by 2007. Now, remember I just said a 1,000 megawatt nuclear power plant. That is 14 of them. That is a lot. We have not

built 14,000 megawatt plants combined—even if you add them all up, it would take quite a few years to do that.

Two days ago, as a result of this bill, a strange-sounding law called PUHCA, Public Utilities something or other——

Secretary BODMAN. Public Utility Holding Company Act.

The CHAIRMAN. Right. It expired, Senator Alexander, a quiet death after years of effort, 2 days ago finally. What does it mean? It probably means more than scores of billions of dollars will be invested in electrical power generation and the like, pretty good business.

Ethanol, the President proceeds well beyond this, and you are going to see to it that the research gets us there. But just what we did has now caused 24 new ethanol plants to be under construction, Senator, 24. Now, each one will employ 50 people. We do not know how many millions it costs to build them. But when we are finished with just that, that will be 2 billion gallons of ethanol that will go into the Nation's fuel supply—not peanuts; ethanol. You are going to dramatically increase it with cellu—help me with the word.

Secretary BODMAN. Cellulosic.

The CHAIRMAN [continuing]. Cellulosic-biomass. We hope it works. We are going to Brazil to see what they are doing. However, they use sugar. We would never use sugar, but that is their product. It is cheap. That is great.

Let me just give you two more, a couple more, and ask about one. There has been a very major American program on a national network about Canada and its tar sands. It is rather remarkable. A year and a half ago, if you would have looked at Canada and said, what are their oil reserves, you would have had a small amount. I am not going to remember the number. But a little time passed, and God did not change the Earth, but all of a sudden the reserves quadrupled or quintupled, let us just use an example maybe, from 2 to 20.

One would say, what happened? Well, what happened was they made tar sands marketable, right. Under today's prices, the oil evaluators said all of this tar sands may be oil. Now, that is fantastic. They are selling us a lot. Environmental problems are being solved.

But now, for us in America, Mr. Secretary, up there in three States plus a little bit in Virginia or West Virginia sits oil shale. Now, oil shale is not tar sands because it is not liquid, but it has locked up in solid oil. We changed something in our bill, the Energy Policy Act, that is dramatically exciting the community, investing community, in oil shale. I think you know that. About 19 applicants for leaseholds are now interested. Shell—not shale, but Shell Oil—has a new technology and they have decided to invest a huge amount of money.

Now, Mr. Secretary, I know the President did not include this in his potential diminution, that is his lowering, of our use of foreign crude oil. But I want to suggest if the breakthrough occurs here and Colorado and Utah and Wyoming can be satisfied, we could take one giant step, as Canada did, and send the world a message that would be incredible. So you are doing something there, I un-

derstand; is that correct? You have got people researching it, you have got some grants out; is that correct?

Secretary BODMAN. Yes, we do, yes.

The CHAIRMAN. What is your own opinion? I know it is a market-driven thing, but you know all about this. Could this be done?

Secretary BODMAN. The people who know the most about oil shale in my experience are the people at Royal Dutch Shell.

The CHAIRMAN. Yes.

Secretary BODMAN. And I know you have visited with those people. They have been by to see me as well. They are very enthusiastic about this new technology, which involves basically boiling it out of the ground. You heat it up and you drive it up, you drive it to the surface using thermal energy. Their estimates of costs that they gave me were very impressive. They did caution that it was still a research program and so forth.

I guess I was a skeptic before and I am less of one now, I guess I would say to you. Oil shale, as you know, has been around for many years. It is a very tough process involving the physical removal. It used to involve the physical removal of the shale and then the boiling it and extracting the oil and so forth. This seems to me to be more reasonable and more potentially interesting. So I guess I would say I am less skeptical than I was.

The CHAIRMAN. More skeptical?

Secretary BODMAN. No, I am less skeptical than I was before.

The CHAIRMAN. You know, you could not say guardedly optimistic? That is too much?

Secretary BODMAN. I could say guardedly optimistic, sure.

The CHAIRMAN. Anyway, let me say so the record will reflect, a long time ago we looked at this and we said, cannot be done. But remember, a long time ago oil was $10 a barrel.

Secretary BODMAN. Yes, sir.

The CHAIRMAN. In fact, when we first looked at it, it was not even ten. So you know, we wasted money investigating that because everybody knew you could not do that. When it got to $30 people got interested. Shell, British Shell, got interested before $30. But they are really interested when it gets to $40, $50 a barrel.

The only issue is when will it come down, if ever. If you are going to invest $15 billion, you do not want to invest it at $60 a barrel and wake up one day and it is down to $30.

The oil-producing countries are very worried about America doing this, right?

Secretary BODMAN. They are worried about it. But the Shell people indicated that the cost that they were estimating for producing oil from oil shale was of such a magnitude that I think they are quite interested at these prices, even at $40 a barrel for oil.

The CHAIRMAN. What I mean is when we looked at it years ago in the Carter administration the producers in the world were thought to be watching, because if we got there it had a very big impact on how much of theirs we would need, right?

Secretary BODMAN. Yes, sir.

The CHAIRMAN. And that is still the case. If this broke through it would be a huge thing.

Closing up this issue, what this company is doing is eliminating the issue of surface damage. They are not going to have to unload

the ground and pile it up. They are going to boil it underground and the oil will be—the shale will be turned into oil underground, and then you will—like you have a Coca-Cola and you put a straw in. You will sip it out at different levels. So I am excited about that and I hope you are.

I want to clear the record and I am sorry the new Senator from New Jersey is not here. I do not want to clear the record, but just state an add-on to his weatherization discussion. The budget will still provide 64,000 weatherization this year.

Secretary BODMAN. Yes, sir, that is what I stated to him.

The CHAIRMAN. So it is not like there is none. It is less. And we will state to you that some of us agree with him, with Senator Menendez—I do not know how many—that we should up it, and we will just have to see whether we can find the money.

Maybe you could help us for the record. If you have an analysis of how well this weatherization is being done and how effective it is, it would be good to have a statement. I am aware in its early stages how it was handled. It has been perfected in terms of the delivery of the product. In its early stages it was not very good. The workmanship was not there.

Secretary BODMAN. It is much better. Now, one of the problems has been getting the installers identified and motivated in each State, in each locality. That has been a challenge. I think that part has been overcome. One of the problems gets to be if you would like to have, which we thought about frankly when we were facing this winter, would it make sense to increase on short notice the amount of weatherization that was done, and it was deemed very difficult to get the crews ready and to get the system—the system works pretty well, but it is not very flexible. Maybe that is the easiest way to put it, in terms of adding additional resources.

The CHAIRMAN. Thank you, Mr. Secretary. I am sorry that I took so much of your time with my comments.

Senator Alexander.

Senator ALEXANDER. Thank you, Mr. Chairman. I am glad you took the time. I was sitting here trying to recover from the visual image of the 50,000 giant wind machines we would need to produce 14,000 megawatts of wind and wondering in whose State they were going to go.

But I have two quick comments and two questions. The questions are about loan guarantees in the Energy Policy Act that we enacted earlier and about distinguished scientists. My comments are, No. 1, I want to congratulate you and the President for the American Competitiveness Initiative. The President is the Nation's agenda-setter. Only he can set the agenda. We can talk, he sets the agenda. For him to put that up front, keeping our brain power advantage, is vitally important to our country's future.

I am glad to see that he has adopted a number of the proposals of the National Academy of Sciences that so many of you in the administration have worked with us on, and we will be having more hearings on those and other ideas. And even in the budget, while we would like to get all 20 of their recommendations adopted and full funding for all 20, the administration's recommendations are a good start.

When we talk about energy, I know you believe this, but I think it is worth saying that this is the foundation for energy independence, that if we want to use coal we have got to figure out a way to recapture carbon. If we want to use nuclear power, we have got to deal with reprocessing and what to do with the waste. If we want to use less oil, we have got to figure out advanced batteries or we have got to deal with hydrogen. So our edge in science and technology is tremendous and I compliment the President for that.

No. 2, I was delighted with the nuclear, the Global Nuclear Energy Partnership, and that you are conceptualizing that, and particularly that you are beginning to address the issue of what we do with the spent fuel. We need to have a serious discussion of the pros and cons of reprocessing. It can reduce the amount of waste by 90 percent. Even more important, it can reduce the heat by more than that and make it possible for us to deal with it.

If we are really serious about global warming, we are going to have to have nuclear power. There is no other way to do it, no other technology that will do it for us. We can do more in conservation. But nuclear power is all we have got in this generation to produce carbon-free energy, and I compliment you for that.

Now, my questions are: one, I would like—and I will ask them both and let you comment. One is, several Senators have talked about adding to our work with the academies and the legislation that will come from that on the PACE Act, that now has 31 Democrats and 31 Republican Senators sponsoring it, the competitiveness legislation. A provision to have 100 distinguished scientists, academy-level scientists with joint appointments at research universities and national laboratories. We have had 20 of those for 20 years at Oak Ridge and the University of Tennessee and it has been a brilliant success. While I do not need your reaction on that today, I hope you will think about that and be prepared to give us a reaction about that.

More importantly——

Secretary BODMAN. If I could just understand, Senator, this is 100 distinguished scientists that would have joint appointments in the laboratory as well as in a university; is that correct?

Senator ALEXANDER. That is correct, sir. And we have had them for 20 years at the University of Tennessee and Oak Ridge, with the State and the university paying half the cost and the feds paying the other half. It has been very successful, and if it has been, why not do it other places. That is the first.

But the question I would like to hear your comments on today has to do with the loan guarantee programs that were in the Energy Act that we passed the middle of last year. This was Senator Domenici's brain child. It was his most important idea. It provided a way for you as Secretary to look across innovative technologies and give them the financial push they needed to get started without costing the taxpayer a cent, because under the formula you evaluate the risk and then whoever applied for the loan guarantee would have to put up that much cost, in effect, to guarantee it.

It could be used for coal gasification. It could be used for advanced nuclear. It could be used for whatever you thought was the most innovative technology.

I would like to know the status of that, whether it is hung up in OMB, what your view of it is, and how soon we will be using it to help us move on a path toward energy independence.

Secretary BODMAN. First, my view is that it is potentially a very important program. The two highest priority items that have come out of the energy bill that we are focusing on with maximum effort are the insurance program for nuclear reactors and these loan guarantees because they are so important.

We have an excellent general counsel. I am very proud of him and pleased with him. He has done a great job. His name is David Hill. I visited with him yesterday about this matter.

If I may just also address the answer to Senator Domenici because he raised this prior to your arrival, sir, and I never really got a chance to answer it. We have visited extensively with other government agencies that offer loan guarantees. We have a little different issue here because this is not a student loan, for example, where sort of one is a copy of the one before. These are all new technologies and they require separate analysis. So one of the issues, frankly, that is on my mind is, how are we going to do this work? This is over and beyond, let us assume we get the loan guarantee thing done and so just the management of it will be I think a formidable undertaking.

Having said that, the loan guarantee itself, if we go through the full development of a Federal rule and go through the issuance of an interim rule and so forth, we are going to be well into 2007 before we get this done. David's approach, our approach, is to work with guidelines and to develop a so-called guideline program in which we can do something short of a Federal rule and maybe get—and therefore we could jump-start this and get it going, and then in parallel move to development of a rule.

We are hopeful, I am hopeful, that using the guideline approach we will have this done and operating this summer. So it is going to take—even that will take a while. But suffice it to say we have got excellent people working on it and they have this as a very high priority.

Senator ALEXANDER. Thank you, Mr. Secretary.

The CHAIRMAN. Thank you, Lamar. Thank you, Senator Alexander. I did not ask it that specifically and neither did he respond. He told me they were busy at it.

Senator Cantwell has been anxiously waiting for a second round. Senator Cantwell has been waiting and I am going to yield to her right now.

Senator CANTWELL. Thank you, Mr. Chairman.

Secretary Bodman, you and I have discussed the situation about tank waste at Hanford. Putting aside whether the Department of Energy meets the milestone or does not meet the milestone, because we keep going round and round about that, but put that aside for a second. We obviously have aging single-shell tanks and they are 7 to 10 miles from the Columbia River.

Now, we know that, from various reports, that seven of those tanks have leaks, an estimated million gallons of contaminants into the soil of the Pacific Northwest. We know that the Army Corps of Engineers has been critical of DOE for the slow process, calling it

imperative, because of seismic issues, to address the issue of already leaking tanks and what could happen in a seismic event.

Secretary BODMAN. This is with respect to the vit plant, the construction of the vit plant?

Senator CANTWELL. No. A Corps of Engineers——

Secretary BODMAN. You mean the effect of the seismic on the tanks themselves?

Senator CANTWELL. On the tanks themselves.

Secretary BODMAN. I see, okay.

Senator CANTWELL. It is imperative that something be done, now, because of the instability of those single-shelled tanks. GAO has also said that, in general, these leaks of waste from the pipelines have one million gallons containing about one million curies of radioactivity, and then go on to say that those contaminants are of concern because contamination—not just the mobility of it in the ground water, is a potential health risk to humans, to fish, from the carcinogens.

So we are getting a very clear picture about the growing threat. Yet we see an administrative budget that cuts $52 million from the tank waste cleanup program at a time when we are heading towards this September 6 milestone, a milestone the inspector general has already said will be missed because of—what did they call it—unrealistic costs, schedules, and assumptions by DOE.

So why would we cut this budget? Why, given what the Army Corps of Engineers has said, would the Department propose further cuts to the single-tank cleanup that we ought to be accelerating?

Secretary BODMAN. All of the water, the fluid that is in the single-hull tanks, has been removed. What remains in the single-hull tanks is a sludge. These are solid materials with a modest amount of liquid with it. The reason that we have reduced the budget and the rate at which we will deal with the removal of that material is that I need to have the vit plant operating as a place to put and process the material when it comes out of there.

We monitor those tanks for any additional leakage, anything that would indicate any instability, and we find none. So there is a monitoring process that is ongoing, and in terms of the management of the single-hull tanks I believe that they are stable and that the delay which is reflected in the budget, that it is caused by the fact that I have brought the construction activity at the vit plant to a halt until we get a better, much better, fix on costs and schedule and what needs to be done than we currently have. That is what is now ongoing.

Senator CANTWELL. So when the Army Corps of Engineers says that "It is imperative the project be accelerated and empty tanks as soon as possible. Tanks and their contents represent immediate risk in a seismic event," you disagree with that?

Secretary BODMAN. Yes.

Senator CANTWELL. So you disagree with the ability to remove the remaining material from the C-tank farms into, say, a double-hull, I mean a double-shell, tank?

Secretary BODMAN. I do not have a double-hull tank that is available.

Senator CANTWELL. Is there not an analysis that is about to be completed by the Department that shows that these newer tanks could withstand and do have capacity?

Secretary BODMAN. Say that again, Senator? I did not understand.

Senator CANTWELL. Does the Department have an analysis that is about to be published?

Secretary BODMAN. If we do, I do not know about it.

Senator CANTWELL. Well, I would like to follow up with both that analysis of moving material, and an answer in writing of an analysis of moving that material from the single-shelled tanks to double-shelled tanks.

Secretary BODMAN. I would be happy to do that.

Senator CANTWELL. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. I think we are close to being finished. I would want to offer you one opportunity, Mr. Secretary. Anything that has gone by that either you did not get to answer as well as you would like or that came up that you might want to amplify before we let you go at this point?

Secretary BODMAN. Obviously, each Senator has issues that are on his or her mind and I have done my best to try to deal with those. I would just emphasize the importance, that I hope all the members of the committee understand the importance of this increase in the science funding. In dealing with a number of these issues, we have had to make tough decisions, but it has been made with a focus on trying to rectify the leadership position of this country in science, which I believe this budget puts us in a position of starting to do. I just would say that, sir.

The CHAIRMAN. Mr. Secretary, I want to make one last observation, but first, process-wise, any additional questions that need to be submitted should be submitted as soon as possible. In fact, if the staff can work at it we ought to have them in by 5 o'clock tonight. If you cannot, let us say tomorrow night.

I want to wrap up with the issue of the Global Nuclear Energy Partnership. You said a while ago that we were producing a great deal of our electricity from natural gas. You could not have been—you were not here when we decided whether we would do that or not. We had a law that said we could not. We decided that we had so much natural gas we ought to let it happen. Never did we think we would not do anything else.

Secretary BODMAN. It seemed like a good idea at the time, I am sure.

The CHAIRMAN. Yes. Now, had we had this Global Nuclear Energy Initiative in place, thus eliminating the very big concern about finishing the cycle, who do we do with the spent fuel rods, we would have built nuclear power plants. That would have displaced the need for natural gas. We would not be in this position.

But the ghost there in waiting on your Global Nuclear Energy Partnership is plutonium. Everyone should know that one of the reasons you have chosen this program and the technology is that the scientists say it is a way to produce recycling without separating out plutonium, which means those who oppose it on a proliferation basis end up having to look at the final product, which

has—there is no ability to use it for bombs because it is not plutonium; it is another compound. That is a very interesting thing that our great scientists did, a great achievement.

We are pursuing that and we do not know when we get to that piece, but it is being worked on already, right?

Secretary BODMAN. That is correct, sir.

The CHAIRMAN. If that happens, then everybody should know another thing that is terribly important. You said it, but let us say it again. We produce all this nuclear power. France produces 70-some percent of their entire electrical power from nuclear. Japan has quite a bit and they are adding. China has seen the light and they are going to add. But when we do it the way we are doing it in America, the finished product, the fuel rods, still have within them 97 percent of the energy from the uranium that we put in. Just think of that.

We would hardly think of doing that with any other energy source. If you put coal in and you say only 3 percent of it burns, right, and you take 97 percent and you throw it away? So it is a good thing it is not a lot of uranium.

But this process, since it goes round and round right at the end, eventually you use the energy from that 97 percent that you would throw away. Is that correct?

Secretary BODMAN. That is correct.

The CHAIRMAN. Second, Yucca Mountain is very worried about what you are going to put in there, right? We are now intending to put those spent fuel rods, with all that tied-up energy, 97 percent, right? If this works, the end product is 100 times less, one poundversus 100 pounds of waste, and the radioactivity longevity, how long it lasts, is reduced from hundreds of thousands of years to a manageable level. Is that correct?

Secretary BODMAN. Yes. If I could just correct one thing, I am not sure—I do not know what the exact number is. I do not think it is that big of a reduction in the physical quantity of the waste.

The CHAIRMAN. Okay, but it is big?

Secretary BODMAN. Well, it is a reduction in the physical quantity. But the big thing is it changes the toxicity by three orders of magnitude. It goes from roughly a million years to a thousand years, the half-life. So it is a thousand years, even though that is of course a long time, but it is more manageable.

The CHAIRMAN. We would not be having any trouble, big problems, if the residual was 1,000 years.

Secretary BODMAN. That is correct.

The CHAIRMAN. We would have that solved. It does not have to be at Yucca. We would already have done it.

Secretary BODMAN. That is right.

The CHAIRMAN. On the other hand, I think the residual, reduction in quantity, is very big and we ought to get that for the record.

Secretary BODMAN. Well, we will work on that.

The CHAIRMAN. That would be a good thing to have.

I had one other thing I wanted you to put in the record, but it escapes me right now. Your time has run out. Thank you, Mr. Secretary.

We stand in recess.

[Whereupon, at 11:48 a.m., the hearing was adjourned.]

APPENDIXES

APPENDIX I

Responses to Additional Questions

DEPARTMENT OF ENERGY,
CONGRESSIONAL AND INTERGOVERNMENTAL AFFAIRS,
Washington, DC, May 30, 2006.

Hon. PETE V. DOMENICI,
Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: On February 9, 2006, Samuel W. Bodman, Secretary, testified regarding the President's FY 2007 budget request for the Department of Energy. Enclosed are the answers to 164 questions that were submitted by you, Senators Wyden, Akaka, Alexander, Bingaman, Bunning, Cantwell, Craig, Landrieu, Menendez, Murkowski, Salazar, Smith, Feinstein, and Johnson to complete the hearing record. If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

JILL L. SIGAL,
Assistant Secretary.

[Enclosure.]

RESPONSES TO QUESTIONS FROM SENATOR WYDEN

Question 1. The Energy Department budget calls for eliminating mandatory funding for the Ultra-deepwater unconventional natural gas and petroleum R&D program. (Fiscal Year 2007 Budget of the U.S. Government, page 99) This week, I introduced a bill that would repeal this program, as the Administration's budget proposes. The bill is S. 2251. Do you support repealing the provisions of the Energy Bill that created the new $50 million per year Ultra-deepwater oil and gas R&D program as my bill calls for?

Answer. Yes, I support the Administration's budget proposal to cancel the program through a legislative proposal.

Question 2. Oregon State University's engineering department has been a leader in the development of safe nuclear reactors. DOE's FY 2007 budget includes an overall increase in nuclear energy, science and technology funding, yet cuts several of the sub-program accounts in this area. Shouldn't safer nuclear reactors be one of the programs that receive increased funding in this year's nuclear energy budget? If not, why not?

Answer. Safer nuclear reactors remain an important part of the Office of Nuclear Energy, Science and Technology's (NE) budget request. During fiscal year (FY) 2007, the Department of Energy (DOE) will continue to develop safer, more efficient Generation IV reactors. Research required for these new power plants will be open to universities, like Oregon State, as well as national laboratories and industry. Also, in FY 2007, work will commence on the initial stages of converting the Oregon State reactor from highly enriched uranium to low-enriched fuel. Within DOE, both the National Nuclear Security Administration and NE will collaborate on conversion of the Oregon State Reactor to low-enriched uranium with the conversion expected to be completed in FY 2008.

RESPONSES TO QUESTIONS FROM SENATOR AKAKA

SUGAR CANE ETHANOL LOAN GUARANTEE PROGRAM

Question 1. In the Energy Policy Act of 2005, there are a number of loan guarantee programs in Title XVII as well as Title XV.

I understand that the Department of Energy is working on guidelines for these loan guarantees and I am pleased to hear this. We need these loan guarantees. They are critical incentives for the private sector and will help with the financing to get new technologies up and running. What can you tell me about the progress on the guidelines for the Sugar Ethanol Loan Guarantee program, which is in Title XV Ethanol and Motor Fuels? When do you anticipate that businesses will be able to use it to secure financing? What do you estimate will be the administrative costs for the loan guarantee programs in the Energy Policy Act?

Answer. The Department is assessing procedures needed to comply with the provisions of the Federal Credit Reform Act and OMB Circular A-129 to implement the loan guarantee provisions of Title XVII of EPACT. The Department's Chief Financial Officer is heading up our efforts. The Department has not developed a specific time frame for completing these activities. The FY 2007 Budget provides no funds to implement loan guarantee provisions.

GAS HYDRATES

Question 2. Over the past few decades, deepwater expeditions to continental shelves confirmed extensive deposits of naturally occurring hydrates. Senator Murkowski and I sponsored the reauthorization of the methane hydrates program. I understand that the Fiscal Year 2007 Budget proposes to cancel the program. I am concerned by this development, as I believe that researching hydrates is important for both energy and climate purposes.

Given the President's expressed commitment to reducing our dependence on foreign oil, the enacted reauthorization of the program, the expected long-term decrease in the supply of natural gas, and the Department of the Interior's proposed increase in its methane hydrates program, can you explain the rationale for cutting this program?

Answer. The decision to terminate the gas hydrates program reflects a strategic assessment of the program compared to other DOE programs. This is in line with our commitment to deliver results for the American taxpayer. The 2007 Budget's proposals to expand access to oil and gas resources, streamline permitting processes, and make the R&D investment tax credit permanent are preferred ways to increase domestic production of oil and gas than federally funded R&D. Several other government agencies, specifically Minerals Management Service (MMS), U.S. Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), and Naval Research Laboratory (NRL), support gas hydrate-related research that is relevant to their missions, focusing on resource characterization and basic research, rather than exploration and production. Some private sector companies are also investigating this potential resource.

GLOBAL NUCLEAR ENERGY PARTNERSHIP

Question 3. On July 12, 2005, Richard D. Lester, Professor of Nuclear Engineering at MIT and founding Director of the MIT Industrial Performance Center testified before the House Subcommittee on Science regarding the viability of Nuclear fuel reprocessing. According to Dr. Lester, while it is important to continue research on advanced fuel research technologies, even in the best case these technologies are not likely to be available for large-scale deployment for at least two to three decades. Moreover, there is no guarantee that the desired performance objectives could be achieved on any timescale. Given these findings, I am concerned about the expenditure of $250 million on the Department of Energy's Global Nuclear Energy Partnership.

Could you respond to the issues of technology development raised by Dr. Lester?

Answer. The Global Nuclear Energy Partnership (GNEP) proposes to perform the research, development, and demonstrations to enable large-scale deployment in two decades, consistent in spirit with Professor Lester's overall statement. The earliest full-scale reprocessing plant would not operate until approximately 2025. Between now and then, GNEP proposes a progression of steps, building on past nuclear technologies and promising results at the laboratory scale. Instrumental in this progression are the Advanced Simulation Laboratory (ASL), Engineered Scale UREX+ Demonstration (ESD) plant, Advanced Burner Test Reactor (ABTR), and the Advanced Fuel Cycle Facility (AFCF). Tentative dates for initial operation of these fa-

cilities would span the next decade. Successful results would enable deployments a decade later.

The technologies that the Department proposes testing are the best available today. Particularly in the area of separations technologies, we have found excellent results at laboratory scale. No technologies on the horizon are so promising as to warrant delay in testing today's best at engineering scale. Research, as Professor Lester proposes, will and must continue. Indeed, the ASL, AFCF, and ABTR will be vital research tools to enable the research that Professor Lester desires. Only through proceeding with the demonstrations of the separations, fuels and reactor technologies will we inform the practical considerations of implementing the full Global Nuclear Energy Partnership program. Only by beginning these demonstrations now will we discover means to reduce their costs and deployment times. And only by beginning them now can we realistically expect them to be ready by the time they are needed decades from now.

RESPONSES TO QUESTIONS FROM SENATOR ALEXANDER

Question 1. When I was Governor of Tennessee, we established at Oak Ridge National Laboratory and at the University of Tennessee a program of about 20 distinguished scientists that held a joint appointment between those two institutions. The scientists were top-notch individuals who were given state-of-the-art laboratory facilities and produced excellent research. Are you familiar with this program, and if so, would you concur with that assessment.

Answer. The Office of Science is aware of the Distinguished Scientist (DS) program between the University of Tennessee (UT) and Oak Ridge National Laboratory (ORNL). This program started in the early 1980s and remains the cornerstone of the Science Alliance, a state-funded center of excellence at UT devoted to building partnerships with ORNL.

A Memorandum of Understanding was written between UT and ORNL, and the first two DS's were hired in the summer of 1984. The program peaked at 12 DS appointments and has declined because of retirements. We agree that the partnership has produced excellent research in such areas as experimental condensed matter physics, neutron science, polymers and fuel cells, condensed matter theory leading to nanophase research in materials sciences, computer science, and nuclear engineering.

Similar programs exist at other national laboratories at different levels.

Question 2. In the PACE-Energy Act, which has been referred to the Energy Committee, we propose establishing up to 100 of these joint appointments nationally at National labs and universities. The Department (through the National Lab) would provide $1 million annually and the university/state would provide a matching amount of at least $1 million annually. What is your reaction to this proposal? How could it be structured so as to be most effective?

Answer. Under the Distinguished Scientist model used by the University of Tennessee and the Oak Ridge National Laboratory, the two institutions first negotiated and signed a Memorandum of Understanding (MOU). This MOU established that UT and ORNL would provide equal payment of the salary, benefits, and support for the Distinguished Scientists. The U.S.ience Alliance (an outreach arm of UT) funds the UT half of each package, and a specific program division at ORNL, which is generally supported by the Office of Science, funds the other half of each package. This model is currently being used for an expansion of the program in Tennessee.

The Distinguished Scientist program at ORNL is one effective model. Similar programs exist at other national laboratories, but each is organized slightly differently. These laboratories may well wish to compare the UT-ORNL model against their own efforts.

RESPONSES TO QUESTIONS FROM SENATOR BINGAMAN

EFFICIENCY PROGRAMS

Question 1. Reductions in Weatherization and Assistance Grants to States—Mr. Secretary—I am at a loss to understand why this budget requests a 32% cut in the low income Weatherization Program at a time when home energy bills are at historically high levels. This is even more puzzling given the higher priority the President has placed on this program—beginning with his campaign pledge to nearly double funding for the program. The Energy Policy Act of 2005 authorizes $600 million for Weatherization in FY07—yet the Administration is requesting only $164 million.

Can you explain the rationale for these cuts in light of the policies?

Answer. From 2002 through 2006, the Administration requested a cumulative total of $1.359 billion for the Weatherization program, nearly doubling the baseline funding assumptions (using 2001 appropriations). Unfortunately, Congressional appropriations from 2002 through 2006 fell short of the Administration's requests by a cumulative total of $208 million. Nevertheless, increased appropriations driven by the President's 2002 through 2006 Budgets led to energy and cost savings for hundreds of thousands of low-income families.

The Administration made very difficult choices in developing the FY 2007 Budget. Reducing America's growing dependence on foreign oil and changing how we power our homes and businesses are among the Department's highest priorities, as outlined in the President's Advanced Energy Initiative.

The Department's benefits models indicate that the Weatherization Program does not provide significant energy benefits compared to the potential benefits of other programs where we are increasing our investments.

Question 2. There is strong support in Congress for aggressive energy efficiency programs as a cost-effective antidote to high energy prices. The Energy Policy Act authorizes several new efficiency programs and enhancements to existing programs. As far as I have been able to determine you have not included funding for these programs in your 2007 budget.

To take just one example—the Energy Policy Act authorizes $25 million for a new program designed to help states adopt the latest building energy codes and to increase compliance with codes. We use 40% of our energy in buildings—so this effort to improve building codes is essential to saving electricity, natural gas and heating oil. Your budget does not include this new program and in fact would eliminate the Department's current $4.4 million building codes training program. Why?

Answer. The Department's FY 2007 budget request includes an increase of $13.8 million for the State Energy Program to support the Energy Policy Act as appropriate and as they determine their own priorities. States can choose to use funding from the State Energy Program formula grants to support programs that increase building code compliance. The Department believes that the States have developed sufficient expertise and capability to upgrade, implement and enforce their building energy codes and has requested no specific funding for increasing and verifying compliance with State Energy codes in FY 2007.

EXISTING EFFICIENCY PROGRAMS

Question 1. The Energy Policy Acts sets aggressive new energy savings targets for the federal government and places a number of related responsibilities on DOE to work with other federal agencies. These include establishing criteria for excluding buildings form the savings targets, developing guidelines for the use of advanced meters in federal buildings, guidelines for the procurement of energy efficient products and the development of an efficiency standard for electric motors. Given this increased workload, why has the funding for the Federal Energy Management Program been reduced? Will the Department meet the deadlines in Section 102, 103 and 104 of the 2005 Energy Policy Act?

Answer. The Energy Efficiency and Renewable Energy budget request for the Federal Energy Management Program shows a decrease of $2.1 million in FY 2007 due to streamlining the Program's management, training and communication efforts. We expect to be able to achieve more with less.

DOE met the deadlines for establishing criteria for excluding buildings from the energy savings targets and developing guidelines for the use of advanced meters in federal buildings under Sections 102 and 103 of the 2005 Energy Policy Act.

DOE has not met the deadline for guidelines for the procurement of energy-efficient products and the development of an efficiency standard for electric motors under Section 104. The guidelines were delayed because the statutory provisions require formal rulemaking proceedings and public comment periods. DOE plans to have the standards issued by this summer.

Question 2. FEMP also has responsibility for the Energy Savings Performance Contracting program. According to the Administration, ESPCs have been critical to the federal government's past success in meeting federal energy savings goals. ESPCs will be essential to the federal government's ability to meet the new EPACT targets. This committee worked closely with the Department and the Administration-to extend the authority for Energy Savings Performance Contracts. However, the program has not rebounded as quickly as we had expected. Is the Department doing everything it can to restore the ESPC program?

Answer. The ESPC program has rebounded well after the lapse in legal authority. During the third and fourth quarters of FY 2005 and the first quarter of FY 2006, the Department of Energy facilitated awards on ESPC projects valued at $108 mil-

lion. The targets for the Super ESPC program in the past have been $80 to $120 million annually. (We have since changed our metric from private sector dollars invested, which agencies must pay back with interest from energy cost savings over time, to energy saved. FEMP strives to achieve the best deal for the taxpayers while helping agencies meet their energy savings goals.)

The Department has been actively working to restore, invigorate and expedite the ESPC program to previous levels and beyond. Project Facilitators will be required for every ESPC project to help federal agencies develop, negotiate, and monitor energy savings performance contracts to ensure that they are in the best interest of the federal government. The Department will provide Alternative Finance Specialists in the field; our Energy Saving Expert Teams (ESET) will recommend ESPCs, as appropriate, as a way to implement projects; and our education and outreach efforts to promote ESPC use will be accelerated, including presentations at various Federal executive-level meetings to emphasize the importance of ESPCs as a means to achieve EPACT 2005 energy reduction goals.

Question 3. Appliance efficiency—At the request of Congress, the Department has developed a schedule to issue appliance standards for the products that are currently backlogged and to comply with the provisions of the Energy Policy Act of 2005. The report was submitted on time—which we appreciate. How do you intend to enforce this schedule? Do you have adequate budgetary resources to meet the schedule?

Answer. On January 31, DOE submitted to Congress ahead of schedule an EPACT-required report detailing the reasons for past delays and the Department's plan for expeditiously prescribing new and amended standards. The plan that the Department has submitted to Congress considers both the backlog and the new requirements detailed in EPACT 2005. The Department is committed to addressing both the backlog and meeting the EPACT statutory requirements. New management processes, including review and reporting requirements, have been instituted. Productivity improvements in the rulemaking program are taking effect and will significantly increase the number of new standards to be issued.

The increased funding request (as shown in the table below) is in direct response to the new requirements of EPACT 2005 and will also allow the Department to clear the backlog of rulemaking activities according to the schedule we have established. In Fiscal Year 2007 the program will complete action on rulemakings started in Fiscal Year 2005 and prior years, and will continue work on the 13 product standards and test procedures initiated in Fiscal Year 2006.

FUNDING SUMMARY

[Dollars in Thousands]

Program/Activity	FY 2005 Approp. (comp.)	FY 2006 Approp. (comp.)	FY 2007 Request	Request vs. Approp.
Equipment Standards and Analysis	10,147	10,153	11,925	+1,772

ENERGY POLICY ACT OF 2005

Question 1a. I'm told that DOE budget staff says that Energy Policy Act of 2005 was enacted "too late" to impact the FY2007 budget process. This strains credulity—the Department was involved in the development of that legislation for four years—and most of the provisions did not change significantly throughout that time period.

Do you intend to amend your budget request to reflect Energy Policy Act of 2005 programs this year?

Answer. The President's Fiscal Year (FY) 2007 budget proposal reflects the Administration's spending priorities for FY 2007. Those spending priorities took into account the spending opportunities presented by the Energy Policy Act.

Question 1b. I'm told that DOE budget staff says that Energy Policy Act of 2005 was enacted "too late" to impact the FY2007 budget process. This strains credulity—the Department was involved in the development of that legislation for four years—and most of the provisions did not change significantly throughout that time period.

I have attached a spread sheet showing what was in the Fiscal Year 2007 budget request verses the sections of the Energy Policy Act of 2005, will you please verify our analysis?

Answer. The Energy Policy Act contains authorizations for a variety of initiatives. As the Administration noted in the July 15, 2005, letter to the conference committee

on H.R. 6, the House and Senate versions include authorizations levels that set unrealistic targets and expectations for future program-funding decisions. Furthermore, many of the activities in the FY 2007 Budget support more than one authorization. Therefore a one-to-one correspondence between the Budget and authorizations in the Energy Policy Act would necessarily be incomplete and a matter of judgment. In formulating the FY 2007 Budget, the Administration has proposed funding levels to advance its energy policy priorities and objectives and successfully implement EPACT 2005. The Administration will continue to plan for efficient implementation of EPACT 2005 through budget requests in future years.

Question 1c. I'm told that DOE budget staff says that Energy Policy Act of 2005 was enacted "too late" to impact the FY2007 budget process. This strains credulity—the Department was involved in the development of that legislation for four years—and most of the provisions did not change significantly throughout that time period.

Will you commit to developing an FY08 budget that implements the Energy Policy Act of 2005?

Answer. The Energy Policy Act contained authorizations for a variety of initiatives. In formulating the FY 2007 Budget, the Administration has proposed funding levels to advance its energy policy priorities and objectives and successfully implement EPACT 2005. The Administration will continue to plan for efficient implementation of EPACT 2005 through budget requests in future years.

INDIAN ENERGY

Question 1. DOE's budget proposes only $3.96 million for 'Tribal Energy Programs'—slightly below last year's appropriation, but 27% below the FY 2005 level. This level of funding is inconsistent with Title V of the Energy Policy Act which establishes a DOE Office of Indian Energy Policy & programs with enhanced authority to assist tribes develop and utilize energy resources. Title V was included in the bill primarily for 2 reasons: (a) to make the most of energy development opportunities on Indian lands that can benefit the nation as a whole; and (b) to fulfill an important federal responsibility by addressing the lack of electricity service still existing on many Indian reservations. When will DOE get this Office up and running so that the tribes have an advocate within the Department seeking to fulfill Congressional intent with respect to Title V of EPACT?

Answer. In order to maintain DOE's commitment to tribal energy, I have asked the Under Secretary of Energy, Science and Environment and the Assistant Secretary of Congressional and Intergovernmental affairs to continue monitoring Tribal issues until a suitable candidate is found to serve as Director of the Office of Indian Energy Policy and Programs. In addition, to assist us in coordinating our Tribal policies between various DOE programs, we have created a Tribal Energy Steering Committee comprised of representatives from all major program offices to address cross cutting Tribal issues.

GLOBAL NUCLEAR PARTNERSHIP

Question 1. What is the total life-cycle cost of GNEP, including the design, construction, operation, and decommissioning of a reprocessing plant and fleet of fast reactors? If there is no cost estimate available when will the Department have such an estimate for Congress?

Answer. One of the primary purposes of the technology demonstrations proposed for FY 2007 and beyond is to produce reliable estimates of the total life cycle cost of GNEP. In 2008, the Department will have better estimates of the cost and schedule to complete the full 20-year demonstration effort, and we will use this information, first, to inform a decision on proceeding with the 20-year demonstration and, second, to better estimate program life cycle costs.

Question 2. Will the reprocessing plant and advanced burner reactors be owned and paid for by private industry or the government?

Answer. Currently we anticipate that the demonstration engineering scale reprocessing experiment plants and the demonstration Advanced Burner Test Reactor will likely be Government-owned. No decisions have been made regarding ownership of commercial-scale facilities.

Question 3. How many times must spent thermal reactor fuel be recycled through a fast reactor in order to eliminate all the plutonium and other transuranic elements?

Answer. Each recycling pass consumes some of the plutonium and other transuranic elements from the previously used fuel. The fraction consumed depends on design details and validation of models and fuels by operation of the Advanced Burner Test Reactor (ABTR) and the Advanced Fuel Cycle Facility (AFCF). Accordingly, a definitive answer would be premature.

Under the Global Nuclear Energy Partnership, used thermal reactor fuel would first be separated to recover the transuranics (TRU) that constitute only about 1 percent of the used fuel mass. The TRU would then be remotely fabricated into fast reactor fuel (which will contain approximately 50/50 TRU and uranium) and irradiated in a fast reactor. The TRU would be preferentially fissioned, so approximately one third of the initial TRU would be destroyed per recycle. The remaining TRU would be recovered by separation, refabricated into fuel along with fresh TRU and returned to the fast reactor.

Repeating this sequence will mean that a quantity of TRU equal to the original amount recovered from used thermal reactor fuel will have been fissioned in approximately three recycles. Some of the original TRU remains in the reactor inventory after those three recycles, but as the recycles continue, this inventory gradually becomes negligible compared with the TRU consumed.

Question 4. Do UREX+ and pyroprocessing meet the National Academy of Sciences' "spent fuel standard"?

Answer. The National Academy of Sciences' "spent fuel standard" was introduced in 1994 as a criterion for judging the adequacy of resistance to theft and proliferation in the context of disposition of excess weapons-grade plutonium. It was not designed to assess commercial fuel cycles. It was based on the belief that a dominant proliferation risk was acquisition of plutonium from used commercial nuclear fuel or weapons inventories. Since then, however, the A.Q. Khan network secretly distributed uranium enrichment technology to several countries, showing that uranium enrichment is a proliferation risk. A comprehensive approach to proliferation resistance must therefore address uranium enrichment, reprocessing, accumulation of weapons-usable inventories, etc. The Global Nuclear Energy Partnership provides a comprehensive approach.

The current international nonproliferation approach could be improved by reducing the motivation for countries seeking nuclear power to develop either uranium enrichment or fuel recycling capabilities. Under GNEP, the United States would build and strengthen a reliable international fuel services consortium under which "fuel supplier nations" would operate both nuclear power plants and fuel production and handling facilities, providing reliable fuel services to "user nations" that only operate nuclear power plants. The Director General of the International Atomic Energy Agency (IAEA) has supported this concept.

The current fuel cycle in many countries, including the U.S., only accumulates used fuel, which does contain weapons-grade material. By establishing recycling of used fuel, GNEP would reduce the inventory of this material. It would do so with techniques that are more proliferation resistant than the PUREX technique because the separated transuranics are far more difficult to handle than the pure plutonium separated by PUREX and because the new techniques (UREX+ and pyroprocessing) will have safeguard and accountability considerations factored into the technology design.

It needs to be emphasized that proliferation resistance associated with used fuel recycle is not dependent upon maintaining high radiation levels but rather depends upon a collection of safeguards, security and accountability mechanisms already developed or being developed for future systems to provide the required proliferation resistance and physical protection. GNEP has been conceived with minimizing proliferation risk as a central theme.

Question 5. What has been the safety record of fast reactors compared to light-water reactors?

Answer. Both technologies are extremely safe. This is based on decades of operating experience with light water reactors and from large-scale demonstrations of sodium-cooled reactors in several countries. These include:

- More than 30 years experience with the French 560 MWt Phenix fast reactor;
- 30 years experience in the United State with EBR-II fast reactor;
- 30 years experience with Japan's 100 MWt Joyo fast reactor;
- 30 years experience with Russia's 1000 MWt BN 350 reactor;
- 25 years experience with Russia's 1470 MWt BN 600 reactor;
- 13 years experience of the U.S. 400 MWt Fast Flux Test Facility; and
- 13 years experience with France's 2900 MWt Superphenix reactor.

Phenix and EBR-II have had minor issues involving such things as sodium leaks, but there have been no nuclear-related accidents at any of them.

In addition, the passively safe design features that have been demonstrated in sodium-cooled reactors will provide an added layer of safety to the Advanced Burner Reactors (ABRs). Commercial ABRs will undergo a safety review and licensing process to assure safe operation for generating power while burning transuranics. The safe burning of transuranics in ABRs reduces the need for burial of these long-lived

radioactive isotopes for tens of thousands of years. The ABR standard commercial plant design would be certified by the Nuclear Regulatory Commission (NRC). All commercial plants based on this design would be licensed by the NRC and operated in accordance with NRC safety standards.

Question 6. Has commercial reprocessing ever been economically successful in this country or any other country?

Answer. The Nuclear Fuels Services plant in West Valley, New York operated successfully from 1966 to 1972, when it was shut down for safety upgrading and did not restart due to a general ban on reprocessing under the Carter Administration. Therefore, there is insufficient economic data available in this country. However, both France and the U.K. built and operated commercially successful separation plants, largely on the basis of contract processing for other countries. Both took advantage of economies of scale, having plant throughputs much in excess of their national requirements. Japan has recently finished its large-scale separation plant.

Question 7. Where do you plan to bury the waste from spent fuel irradiated abroad under your "cradle-to-grave" fuel leasing program? Yucca Mountain? Which ports do you intend to bring it through?

Answer. GNEP does not envision storing spent fuel from abroad in a geologic repository in the United States. The resultant by-product waste from recycling envisioned in the Global Nuclear Energy Partnership plan would be the responsibility of the country generating the waste and would be returned to the country of origin.

Question 8. Where will the reprocessing plant be located? Are you planning on shipping spent fuel from the existing reactor sites to an interim storage facility and then to a reprocessing plant, and shipping the waste from the reprocessing plant to Yucca Mountain, or do you plan to put the interim storage facility and the reprocessing plant at Yucca Mountain?

Answer. The decision of where the Uranium Extraction-plus (UREX+) Engineering Scale Demonstration (ESD) project will be located has not been determined. DOE will initiate the appropriate analyses and reviews required under the National Environmental Policy Act (NEPA) this fiscal year to inform a decision by 2008 as to where the demonstration of UREX+ would be located. The Department has made no decisions regarding interim storage and the Nuclear Waste Policy Act currently imposes certain restrictions on available options. Other alternatives identified during public scoping meetings will also be considered. The storage and management of the waste and material generated by the UREX+ demonstration in each alternative will also be evaluated as part of the NEPA process.

While reprocessing has the potential to make the fuel cycle much more efficient by greatly reducing the volume of material that needs disposal in a geologic repository, it will not be available to process large volumes of spent fuel for at least two decades. The Department currently has no plans to store existing spent fuel for possible reprocessing in the future. Rather, the Department is committed to moving forward with our obligation to take spent fuel and dispose at Yucca Mountain once it is licensed and ready for operation.

LANL CLEANUP—LOSS OF SOIL AND WATER REMEDIATION FUNDING

Question 1. Mr. Secretary, it is my understanding that the Department has proposed reducing the Los Alamos Soil and Groundwater Remediation budget, project VL-LANL-0030, by $70 million from $98.4 million to $28.3 million. I am told this will result in failure to comply with the New Mexico consent order for Los Alamos that was entered into last year forcing a failure to meet 35 compliance milestones and fines up to $16 million.

Why did the Department reduce remediation funding by 70 percent when it will result in fines and bad faith between a carefully negotiated agreement?

Answer. As you know, we have had significant performance issues for years with the previous contractor's environmental work at Los Alamos National Laboratory. Additionally, Los Alamos has not yet been able to provide an integrated cost and schedule baseline that the Department is able to validate.

We believe that the new contract will address these performance issues, offer us new opportunities to continue significant cleanup and risk reduction, and deliver progress towards a new baseline. To that end, senior officials within the Department of Energy have asked for the involvement of senior executives of the parent companies of the new contractor to deliver efficiencies and a baseline that can withstand scrutiny and can be validated by the Department of Energy. We assure you that we remain committed to the Los Alamos Compliance Order on Consent (March 2005) with the State of New Mexico and its environmental milestones.

PENSION LIABILITY

Question 1. Mr. Secretary it is my understanding that the Department faces up to $11 billions in pension liability for its contractors of which $9.2 billion is post retirement commitments such as retiree health.

What policies is the Department putting in place with respect to pensions?

Answer. Consistent with the goal to mitigate cost volatility and liability growth in contractor pension plans, the Department is taking steps to ensure that as contracts are re-competed, solicitations require (unless otherwise required by law) the provision of market-based pension plans competitive for the industry to new, non-incumbent employees hired after the date of contract award. The solicitations also provide that incumbent employees will remain in their existing pension plan(s) pursuant to plan eligibility requirements and applicable law; that is, "if you're in, you're in." Since January 1, 2005, we have awarded nine contracts containing the requirement that DOE facility contractors establish market-based pension plans for all new employees hired after contract award. DOE believes this is an approach that is fair, reflects current best commercial practices, and will enable the Department to continue to attract contractors and contractors to attract the best employees.

Question 2. Mr. Secretary it is my understanding that the Department faces up to $11 billions in pension liability for its contractors of which $9.2 billion is post retirement commitments such as retiree health.

Does the Department envision reducing retiree health benefits?

Answer. Consistent with the goal to mitigate cost liability growth in contractor medical benefit plans and consistent with and applicable legal requirements, the Department is currently assessing its approach and exploring options to address the issue of retiree medical coverage for contractor retirees. The Department is also taking steps to ensure that as contracts are re-competed, solicitations require that incumbent employees benefits be comparable to what they have currently and market-based benefits be provided to employees hired after the date of contract award.

Question 3. Mr. Secretary, as you know, Senator Domenici and I wrote you a letter on January 27 requesting that the Department ask the University of California to cease in its proposed actions to separate out the Los Alamos pension plan from the overall UC Retirement Plan. This only causes more anxiety to a contract process that has from the start caused a loss of moral at Los Alamos.

What actions have you taken in response to this letter?

Answer. Under Secretary Brooks has written the President of the University indicating that our expectation has been that the existing population of LANL retirees and employees who elect to leave their interest in the UCRP after the transition to management of LANL by LANS remain within the UCRP. He also indicated that we were not favorably inclined towards UC's proposal, although, if one were submitted to the Department, we would have to consider it. He is also sending a letter to UC asking that it communicate both its intentions and its plans to its employees and state clearly that it has not provided a proposal to the Department for its review and approval.

PROLIFERATION RESISTANCE

Question 1. In a speech last year, Secretary Bodman said "It is important to note that in addressing reprocessing—or recycling—technologies for dealing with spent fuel, we are guided by one overarching goal: to seek a global norm of no separated plutonium."

That reasonable goal is built on the premise that separated plutonium is a profound proliferation and terrorism risk.

Yet the additional transuranic elements that the proposed UREX+ technology is intending to leave with the separated plutonium do not, in fact, greatly reduce the risks associated with the plutonium. The neptunium, americium and curium are not radioactive enough to prevent theft or diversion, and would work in a nuclear weapon or could be separated from it with relative ease, without the need for shielding and contact-handling.

Given that, how can the DOE's proposal meet the Secretary's nonproliferation goal?

Answer. GNEP is fully consistent with the Secretary Bodman's statement that with regard to spent fuel recycling we should "seek a global norm of no separated plutonium." GNEP aims to change the fundamental and institutional nature of the international nuclear fuel cycle by limiting the number of states that possess stocks of plutonium. In particular, the goal is to enable the global growth of peaceful nuclear programs while reducing existing stocks of separated plutonium and ending the accumulation of spent fuel around the world. Specifically, GNEP proposes that: 1) sensitive processing facilities and separated materials would be limited to a small

number of advanced fuel cycle states with currently existing reprocessing capabilities; 2) these fuel cycle states would provide reliable fuel services and supply to the larger number of reactor states; and 3) GNEP R&D will focus on technologies that do not separate plutonium and will further strengthen the nonproliferation elements and international safeguards approaches applied to these processes.

The buildup of separated civil plutonium in the world has not stopped over the past three decades. GNEP seeks to address the global build up of civil plutonium stocks and looks to move beyond the spent fuel standard by defining a path to reduce and eliminate those materials.

U.S. leadership is essential to developing a credible alternative to the existing unsustainable once-through cycle we employ, and the current PUREX and MOX programs overseas. Over time, implementation of a fuel cycle state and reactor state system and a transition away from separated plutonium in commerce will meet the Secretary's nonproliferation goal.

Question 2. In a speech last year, Secretary Bodman said "It is important to note that in addressing reprocessing—or recycling—technologies for dealing with spent fuel, we are guided by one overarching goal: to seek a global norm of no separated plutonium."

That reasonable goal is built on the premise that separated plutonium is a profound proliferation and terrorism risk.

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How does the "proliferation resistance" of the proposed plutonium mix compare with the self protecting standard of the IAEA?

Answer. The IAEA standard for self-protection under the Guidelines on the Physical Protection of Nuclear Material and Nuclear Facilities is based on the requirement for heavy shielding in safely handling highly radioactive nuclear materials. Standards such as these play an important role in the physical protection planning of all nuclear facilities. It was not designed to assess the proliferation resistance of commercial fuel cycles.

Proliferation resistance associated with used fuel recycling is not solely dependent upon maintaining high radiation levels but rather depends upon a collection of safeguards, security and accountability mechanisms already developed or being developed for future systems to provide the required proliferation resistance and physical protection. GNEP has been conceived with minimizing proliferation risks as a central theme.

Question 3. Given the very high cost of PUREX plants, the long experience with PUREX that suggests that only modest future cost reductions are likely, and the great similarity of UREX+ to PUREX, what factors make the administration believe that UREX+ will be a cost-effective and safe approach to processing spent fuel? What factors does the administration believe make UREX+ preferable to pyroprocessing? What factors have led to other separations technologies being discarded? How confident can we be that the factors identified, which have convinced the administration that UREX+ is preferable today, will hold up as the technology is scaled up from grams to tens of thousands of tons?

Answer. While both PUREX and UREX+ technologies are essentially chemical separations processes the "flow sheets" or detailed engineering processes for the two technologies are substantially different. For example, PUREX is a "batch" process while UREX+ is a more efficient "continuous" process. The Department selected the UREX+ process because of its ability to separate the transuranic elements from commercial light water reactor spent fuel, providing an added degree of proliferation-resistance over current generation PUREX technology. It was also selected because of the high level of purity achieved when the technology was demonstrated at the "bench scale," that is, when treating on the order of 2-3 pounds of spent fuel. This high level of purity is necessary in order for the transuranic product to be consumed as recycled fuel in an advanced fast reactor system.

An engineering scale demonstration of the UREX+ technology is an important step before committing substantial funding to deploying an industrial scale plant to treat commercial spent fuel. It will enable testing full size process equipment and components in a setting where extended continuous operations provide important information related to component reliability and process performance, including confirming the efficiency of recovery of transuranic elements and the achievement of adequate purification levels to make the materials reusable as recycled fuel. An engineering scale demonstration will demonstrate the safety, efficiency and the eco-

nomics associated with possibly deploying a full scale facility in the future to treat commercial spent nuclear fuel.

In the longer term future, technologies such as pyroprocessing, may be more suitable for treating fast reactor fuel and the Department has an ongoing research effort aimed at exploring the suitability of this technology for these advanced fuels.

Question 4. The MIT study on the future of nuclear energy reviewed reprocessing and waste management technologies in detail, and recommended that "For the next decades, government and industry in the U.S. and elsewhere should give priority to the deployment of the once-through fuel cycle, rather than the development of more expensive closed fuel cycle technology involving reprocessing and new advanced thermal or fast reactor technologies." The study recommended a "major reordering of priorities" of U.S. nuclear R&D programs, to focus primarily on improved once-through fuel cycle technologies (without reprocessing)—in stark contrast to the major ramp-up in reprocessing R&D President Bush is now proposing. Similarly, the bipartisan National Commission on Energy Policy recommended against moving forward with reprocessing, and focusing instead on dry cask storage and ultimate disposal of spent fuel. Why do you think these groups came to exactly the opposite conclusion that you have come to, in examining this problem?

Answer. A geologic repository is a necessity under all fuel management scenarios and the Administration has proposed $544.5 million in FY 2007 to maintain steady progress toward opening the Yucca Mountain repository. The Administration also strongly supports maintaining and expanding nuclear power as a safe, non-polluting source of energy. If nuclear power remains a vital part of the nation's energy supply throughout this century, the continued use of the once through fuel cycle will require multiple repositories. In addition to its ability to reduce international threats of nuclear proliferation, GNEP offers the potential to expand Yucca Mountain's capacity to handle the country's nuclear waste from current and future reactors especially if the existing statutory provisions that limit disposal at Yucca Mountain to 70,000 metric tons is repealed. In addition, the waste put in the repository after reprocessing would be less toxic. The MIT and National Commission on Energy Policy studies failed to recognize these advantages of recycling.

WASTE

Question 1. What total volumes of nuclear waste, and of what types, are expected to be produced in the course of reprocessing?

Answer. The Department does not currently have estimates of waste generation from the advanced reprocessing technologies. In general, the purpose of the Advanced Fuel Cycle Initiative and the demonstration of recycling technologies under GNEP is to minimize waste. Estimates of waste generated by reprocessing will be developed as the engineering design for the advanced recycling demonstration facilities proceeds.

Question 2. Would additional low-level waste repositories be required if the United States pursues a reprocessing program?

Answer. The Department cannot say at this point whether or not additional low-level waste disposal facilities would be required in conjunction with efforts to demonstrate advanced reprocessing technologies. Estimates of waste generated by reprocessing will be developed as the engineering design for the advanced recycling demonstration facilities proceeds. In general, the purpose of the Advanced Fuel Cycle Initiative and the demonstration of recycling technologies under GNEP is to minimize waste.

Question 3. France, which has reprocessed its spent fuel, must now find a repository for its spent MOX fuel, which is thermally hotter than our light water reactor spent fuel and thus more difficult to manage. How did reprocessing help France deal with its spent fuel?

France also built two fast reactors, neither of which worked safely or economically. What is the international experience with fast reactors? Given that DOE's program assumes building a new generation of fast reactors that would transmute the plutonium, what is DOE's projected time-frame for developing and building these reactors?

Answer. The French Mixed Oxide Fuel-recycling program is based on plutonium-only separation using the PUREX technology and is aimed at modest energy recovery from the plutonium and improved waste management. Thermal recycle in France decreases the ratio of fast reactors to advanced thermal reactors needed to stabilize and ultimately eliminate plutonium and the minor actinides from the high level waste. The ultimate waste form in France, glass at present, is much more resistant to leaching than the once-through fuel spent fuel, thus reducing the technical requirements for repository design. No country sees recycling as a way to

eliminate the need for a geologic repository. Those who do recycle believe it improves repository performance.

The international experience with fast reactors includes:

- More than 30 years of experience with the French 560 MWt Phenix fast reactor
- Thirty years of experience in the United States with the EBR-II fast reactor
- Thirty years with Japan's 100 MWt Joyo fast reactor
- Thirty years with Russia's 1000 MWt BN 350 reactor
- Twenty-five years with Russia's 1470 MWt BN 600 reactor
- Thirteen years of experience with the U.S. 400 Mwt Fast Flux Test Facility
- Thirteen years of experience with France's 2900 Mwt Superphenix reactor

The Department's plan for demonstration of fast reactor technology for consuming transuranics calls for demonstrating the technology in the 2014 timeframe with commercial deployment after 2025.

Question 4. The budget request puts a priority on developing the reprocessing technologies, while virtually ignoring the questions on fast reactors—the key technology needed to actually reduce the radioactivity of the waste. How will reprocessing solve the waste problem if we don't have fast reactors? The world already has more than 100 tons of "orphan" separated plutonium. Would it not make sense to see first whether fast reactors can be commercialized before creating more plutonium?

Answer. Recycling, fuel, and reactor technologies are mutually supporting and need to be developed in a sequence that ensures that the necessary parts will be in place at the time they are needed. Three major projects need to be developed and demonstrated. to confirm the application of advanced recycle technologies for commercial light water reactor used fuel cycle. These are: 1) the Engineering Scale Demonstration (ESD) of the UREX+ separation process, 2) the Advanced Fuel Cycle Facility (AFCF) to develop transmutation fuel for the test reactor, and 3) the Advanced Burner Test Reactor (ABTR) to confirm transmutation of the highly radioactive material contained in used fuel. Successful demonstration of these technologies would represent the demonstration of a proliferation-resistant, closed fuel cycle.

The major technical challenges are in the areas of the separation of used nuclear fuel, the manufacture of new fuel from recycled products, and the destruction of the long-lived radioactive materials in a nuclear reactor. These challenges are key to dealing with the waste problem, and will be addressed both through continued research in the laboratory and new demonstration facilities. An ESD of the separations technology will demonstrate continuous operations of an integrated separations process containing a series of solvent extraction steps using different solvents to demonstrate safe and effective waste and storage forms for materials with high heat generation. All scenarios require demonstration of UREX+ to separate existing used U.S. nuclear fuel, hence the importance of the ESD; there is no reason to delay moving forward with UREX+ for treatment of existing light water reactor fuel.

The AFCF would be pursued to develop remote fuel fabrication processes for fast reactor recycle fuel containing significant amounts of highly radioactive materials that can be used as fuel in fast reactors. An ABTR will be developed to demonstrate effective transmutation of the highly radioactive materials separated out from used nuclear fuel, and produce electricity at competitive rates. The missions for both AFCF and ABTR include examination of several fuel and reactor-detail variations.

Question 5. Which long-lived radionuclides (that have half-lives in the thousands to millions of years) will be difficult to deal with by "recycling"?

Answer. Krypton-81, a chemically inert fission product, has a half-life of 230,000 years. It can be collected from recycling plant gaseous effluents by activated charcoal. Cesium-135 has a half-life of 2.3 million years. A mixture predominantly of Cs-137 and Sr-90, both with approximately 30-year half lives, will be separated during recycle and placed in an aluminosilicate waste form. Even with the small amount of Cs-135 remaining, after several hundred years of safe storage, the final Cs/Sr product will be classified as low-level waste and can be safely disposed of in existing sites. There are no other long-lived radionuclides which cannot be successfully managed through recycling and safe disposal. Under GNEP, long-lived transuranics will be fissioned in fast spectrum reactors. Fission products along with process losses will be incorporated into leach-resistant matrix materials (e.g., borosilicate glass) and placed in a repository. Those fission products are not significantly different from the fission products with uranium dioxide pellets in the current inventory of spent nuclear fuel.

COST

Question 1. What are the costs for physical protection and safeguards of the plutonium-bearing material separated by the reprocessing technologies?

Answer. The Department is not currently in a position to make a determination of the cost of safeguards for the plutonium-bearing material separated by reprocessing technologies associated with the demonstration program. That determination will be made as the Department proceeds with the design of the facilities and the processes that would separate the transuranic materials from the spent fuel.

Question 2. What do you estimate the net per kilowatt hour cost increase would be for nuclear electricity if the United States used reprocessed plutonium as a fuel instead of uranium?

Answer. The demonstration of the recycling, reactor and fuels technologies is required to answer this question. Crude estimates available at this time suggest that the per-kilowatt-hour cost increase of nuclear-generated electricity would increase in the range of 10-20 percent for a completely closed fuel cycle using fast reactors to recycle and burn transuranic material from light water reactor spent fuel.

A discussion of this potential cost range is given in the 2002 Organization for Economic Cooperation and Development/Nuclear Energy Agency "Accelerator-Driven Systems (ADS) and Fast Reactors (FR) in Advanced Nuclear Fuel Cycles—A Comparative Study." Recent papers, such as one presented by Charles Boardman of General Electric (GE) at the April 2001 International Conference on Nuclear Engineering (ICONE 9) indicate GE's belief that fast reactors could be completely competitive with light water reactors.

ADVANCED MINING DIAGNOSTIC TECHNOLOGIES

Question 1. Can you please comment on the status of the Mining Industries of the Future program and in situ diagnostic technologies such as those in section 955 of the Energy Policy Act including Radio Imaging Methods?

Answer. No funds were requested for the Mining Industries of the Future program in FY 2007. While industry remains a major energy end-use sector of the Nation's economy, significant gains in energy efficiency have already been achieved (output since the 1970's has more than doubled for essentially the same energy consumption). Significant economic incentives exist for industry to continue on its own to invest in new, more efficient technologies. In developing the FY 2007 Budget, the Administration prioritized programs that address America's growing dependence on oil and could change how we power our homes and businesses, as outlined in the President's Advanced Energy Initiative.

Section 955 of EPAct 2005 does not specifically reference the Mining Industries of the Future program. A Department of Energy funded technology called Radio Imaging Method System 4 (RIM-IV) developed in partnership with Stolar Research Corporation of Raton, New Mexico, was recently successfully tested. RIM-W detects geologic anomalies ahead of mining which will reduce energy use, costs, and operational problems associated with seam mining. This technology received a prestigious R&D 100 Award and was developed in cooperation with the National Energy Technology Laboratory and Sandia National Laboratory. A second ITP-sponsored project, Crosswell Imaging Technology & Advanced DSR Navigation for Horizontal Directional Drilling, also developed in partnership with Stolar Research Corporation, will develop and demonstrate real-time measurement while drilling (MWD) for guidance and navigation of drill strings during horizontal drilling operations. These projects are expected to bring this technology closer to commercialization.

RESPONSES TO QUESTIONS FROM SENATOR BUNNING

Question 1. America is blessed with an abundant source of energy: Coal. Coal is essential to producing electricity and helping our country achieve energy independence. President Bush high lighted this importance in his State of the Union last week. Yet the Department of Energy Budget before us today proposes nearly $50 million in cuts for Coal R&D programs. Can you explain this decrease?

Answer. We agree that coal is essential to helping our country achieve our goal of energy security while addressing the environmental concerns over the use of coal. We believe that the President's fiscal year 2007 Budget request reflects a commitment to a strategic coal research program that will allow us to achieve that goal. We also believe it represents a balanced portfolio of critical coal research that will allow us to achieve our program goals. The 2007 Budget provides $281 million for the Coal Research Initiative, nearly completing (total of $1.9 billion requested from 2002-2007) the President's $2 billion, ten-year commitment for clean coal R&D four years ahead of schedule. The coal budget focuses primarily on technologies for near-

zero atmospheric emissions plants, which will be brought together in the FutureGen prototype plant. The Budget requests $322 million for development of these technologies (some of which are not counted in the Coal Research Initiative), an increase of $21 million over the 2006 enacted budget level of $301 million for these technologies. The Budget restricts the addition of new funds to the Clean Coal Power Initiative, so that the program can take steps to improve the use of funds already provided for projects.

Question 2. You have proposed cutting funding dramatically to the Clean Coal Power Initiative. The DOE budget only asks for $5 million that is a $45 million decrease from last year's funding level. Given the need for this technology, why are you practically zeroing out funding?

Answer. The 2007 Budget provides $281 million for the Coal Research Initiative, nearly completing (total of $1.9 billion requested from 2002-2007) the President's $2 billion, ten-year commitment for clean coal R&D four years ahead of schedule. Within the Coal Research Initiative, the Department will continue its program in support of the Clean Coal Power Initiative (CCPI). The Budget reduces the addition of new funds to CCPI, so that the program can take steps to improve the use of funds already provided for projects. As identified in its Program Assessment Rating Tool (PART) review, CCPI and its predecessor demonstration programs have over $500 million in unobligated balances committed to selected projects, including money for projects that were selected several years ago and have not begun construction. The program is working to improve project selection to ensure consistency with the R&D Investment Criteria, withdraw funds when projects stall, and to improve contract and project management controls to achieve the desired results. Ongoing CCPI projects, FutureGen, and various tax incentives including those authorized in the Energy Policy Act of 2005 continue to provide' incentives for demonstration of clean *coal technologies. The fiscal year 2007 request for CCPI of $5 million, along with funds from the prior appropriations will go towards the accumulation of funds for a future CCPI solicitation. In addition, if other clean coal projects do not go forward, then any additional prior year clean coal funding that becomes available will also be applied towards the funding for a future CCPI solicitation.

Question 3. The DOE has argued that there is a $500 million backlog of appropriated funds that are not being used. Many of these unused balances are just waiting for permitting and environmental review, which routinely takes years. By cutting funding now, the DOE could delay the next round of project solicitations for years. Is this your intent with cutting clean coal power funding?

Answer. The Department's intent is to continue its support of the Clean Coal Power Initiative (CCPI). The fiscal year 2007 request for CCPI of $5 million, along with funds from the prior appropriations, will go towards the accumulation of funds for a future CCPI solicitation. It will not reduce funding for current CCPI projects; they are fully funded. In addition, if other clean coal projects do not go forward, then any additional prior year clean coal funding that becomes available will also be applied towards the funding for a future CCPI solicitation.

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Question 4. The cleanup at the Paducah site is supposed to be on an accelerated schedule. Last year, Congress appropriated $105 million, but this year only $96.5 million was budgeted. How are we supposed to be accelerating the cleanup while decreasing the funds each year?

Answer. In FY 2006, the Paducah site received appropriations above the President's request to Congress. This allowed the Department of Energy (DOE) to accelerate several projects ahead of its originally planned start dates. The FY 2007 budget request is consistent with the DOE's previous request and planned activities. The FY 2007 Paducah request meets the project baseline requirements, ensures compliance with regulatory commitments, and supports the 2019 completion date.

Question 5. The Administration's budget funds the former worker medical screening program at $12.3 million, which is about $4 million less than Congress appropriated last year. Why has the Administration requested less funding this year?

How much has the Administration allocated for the Paducah medical screening program?

Answer. The Department's FY2007 request for $12.4 for the Former Worker Medical Surveillance Program (FWP) is essentially level with the Department's FY2006 request of $12.5 million for the FWP.

The Department has allocated up to $400,000 in funding for the screening of workers from the Paducah Gaseous Diffusion Plant. The exact level of funding would depend on the number of former Paducah workers interested in medical screening.

Question 6. I am pleased that the Department of Energy finally has completed its rule on worker health and safety regulation for DOE sites. I helped implement this law in 2002 to provide DOE workers with similar legally enforceable worker health and safety rules that private companies must follow. How does the DOE plan to ensure adequate funding and enforcement of this rule?

Answer. The Department delineated $860,000 in FY 2007 budget request to implement and enforce the rule. The funding falls under the Energy Supply Budget—Policy, Standards and Guidance and will be employed by the Office of Environment, Safety and Health (EH)'s Office of Health ($410,000) and under Energy Supply Budget—DOE-Wide ES&H Programs ($450,000) In addition to this funding, the FY 2007 budget also includes funding in Program Direction for three federal FTEs to conduct worker safety and health enforcement.

The Office of Health will develop an implementation guide and conduct implementation workshops at various DOE facilities to ensure proper implementation of the rule.

Question 7. America also has a large resource of oil shale and tar sands, both in the east in my state of Kentucky and in the western states as well. The technology for recovering oil shale and tar sands has improved dramatically in recent years. What plans does DOE have to take advantage of this energy source?

Answer. Recently high oil prices, shrinkage in the world's unutilized oil production capacity, and anticipation of global growth in oil demand have stimulated private investment in oil shale and tar sands technologies. These technologies are not yet proven and it will be at least two decades before a commercial industry contributes significantly to domestic production. One of the primary factors delaying investment in these technologies has been uncertainty over the permanence of high oil prices. Nevertheless, given supply and demand trends, the private sector will eventually decide when, and how to invest in these technologies even with market uncertainty. Whichever technology proves to be economic, this development will be a way of increasing domestic production and new sources of foreign production in stable regions of the world. Section 369 of the Energy Policy Act of 2005 directs the Department of Energy to take various actions to encourage development of these unconventional resources, and we are making progress in complying with that goal.

RESPONSES TO QUESTIONS FROM SENATOR CANTWELL

Question 1. Secretary Bodman, I'm aware that the cost of crude oil is driven by the world market and that it's cost is currently significantly above historic averages. But I'm not aware of any substantive increases in the cost of producing crude oil, the cost of refining it into various petroleum products such as gasoline and diesel, and the cost of transportation of refined products to markets. If the percent difference in the prices isn't pure profit, please explain what you think accounts for the difference in the substantially lower increase in crude oil when compared to gasoline.

Answer. Retail prices for petroleum products, such as gasoline and diesel fuel, are affected by many factors, of which crude oil prices are arguably the most important over the long term, but other influences may be even more significant during specific periods. Price differentials between crude oil and petroleum products vary significantly over time due to a number of influences, the greatest of which is seasonality. Even in the absence of changes in the underlying cost of crude oil, gasoline prices exhibit a seasonal cycle over the course of the year, rising before and during the summer, when demand for it is greater, and falling in the winter.

Additionally, unusual conditions in gasoline markets, especially supply interruptions, can significantly affect the differential between gasoline and crude oil prices. This was seen following Hurricanes Katrina and Rita, which disrupted crude oil production, a large amount of domestic refinery capacity, and, for a short period, product pipeline operations. The disruption of crude oil production in the Gulf of Mexico caused crude oil prices to rise, which also caused gasoline prices to rise. But in addition, the refinery and pipeline outages caused a reduction in gasoline supplies, thus

causing a further increase in gasoline prices above and beyond that seen in crude oil prices.

While such a situation can, in fact, result in increased profit margins for those suppliers less affected by unusual conditions, the prices and differentials are the natural result of the tighter balance between supply and demand, and not necessarily indicative of intentional price manipulation on the part of suppliers. Also, the higher margins serve to attract new supply, such as the increased gasoline imports seen after the hurricanes, helping the market to self correct.

Question 2. Secretary Bodman, the recent hurricanes resulted in the need to import substantial refined products such as gasoline, diesel fuel and aviation fuel to meet U.S. demand. The question has been raised as to whether the country should develop a strategic reserve of finished petroleum products. Do you think the Federal government, either directly or by way of contract with the private sector, ought to create a strategic reserve of finished petroleum products? Since these products have a limited shelf life, one proposal is to obtain and operate a number of refineries and have the products be used by the Federal government. Appreciate your comments on this proposal.

Answer. Since the refinery outages of 2005, many refiners have announced plans to add significant capacity to existing U.S. refineries (totaling over 1 million barrels per day of additional capacity). This is encouraging.

The Administration understands the need for an increase in domestic refining capacity. On April 25th the President announced his four part plan to confront high gasoline prices. This plan calls on Congress to allow refiners to make minor modifications to their refineries without having to endure years of delays in the approval process, and the President called on Congress to simplify and speed up the permitting process for refinery construction and expansion.

Regarding establishing a refined Petroleum Reserve, the Administration believes that storage of crude oil is the most flexible, cost effective option to protect against an array of disruption scenarios.

Question 3. Secretary Bodman, do you support more transparency in the oil and natural gas markets, as would be provided in my bill S. 1735?

Answer. The Administration supports measures that would increase transparency in energy markets so long as it would not facilitate collusion. However, we have several concerns about certain provisions of S. 1735. In particular, we are concerned that factors such as "gross disparity between the price of the crude oil . . . and the price at which it was offered for sale" or "the amount charged grossly exceeds the price" would not offer operational definitions that would enable transparent enforcement of Section 2. We are concerned that inappropriate efforts to address price gouging could inadvertently induce shortages *by masking necessary price signals to suppliers and consumers and thereby* worsen consumer conditions. In addition, we believe that the States and Federal government generally have adequate laws to address illegal, anti-competitive practices. Finally, we believe that the control of anticompetitive behavior within a State better lies within the purview of State governments, rather than the Federal Government, and the Administration stands ready to provide necessary assistance to help State Attorneys General to identify and prosecute those engaged in anticompetitive practices.

Question 4. Secretary Bodman, how has the last 3 years of escalating gasoline prices affected demand by American drivers? Have we seen a correlation between a certain level of price increase and less demand by American drivers? What is the actual level of reduced demand today compared to 3 years ago (please respond in the context of a doubling of retail gasoline prices)?

Answer. During the last three years (2003-2005), regular gasoline prices have increased from $1.56 per gallon to $2.27 cents per gallon, a 31-percent increase. During that same time, annual average gasoline demand grew from 8.93 million barrels per day in 2003 to 9.13 million barrels per day in 2005, about a 2 percent increase over the period. In 2004, the price of gasoline was on average 29 cents per gallon higher than in 2003 while motor gasoline demand was 2 percent higher than in 2003. In 2005, the average price of gasoline rose another 42 cents while gasoline demand growth slowed to almost zero (0.2 percent based on EIA's latest *Short-Term Energy Outlook*). Gasoline demand would have increased more had prices been lower; the growth in demand reflects the effect of the growing U.S. economy, despite the significant price increases.

Gasoline demand tends to respond rather slowly to price increases since the stock of automobiles turns over very slowly and consumers are faced with limited choices with respect to their driving habits, and therefore cannot react very rapidly to sudden changes in price. Nevertheless, based on EIA's short-term energy model, about twice the amount of cumulative growth in gasoline demand between 2003 and 2005 (approximately 4 percent instead of just over 2 percent) would have been expected

(compared to current actual data and estimates) if gasoline prices had remained constant over the period.

Question 5. Secretary Bodman, what are the crude oil extraction costs for major oil producing countries, including our own? How does that compare with oil derived from shale or coal?

Answer. Given the absence of total cost data for conventional oil production in the United States and the world, and given the accounting issues of defining what costs are included and how joint costs are allocated among oil fields, one has to rely on indirect indicators of the relative cost of conventional oil production among the world's petroleum provinces. Generally, there are three metrics for indirectly measuring an oil field's production cost, which are presented in the following order of relative importance: 1) the size of the field (i.e., the original oil in-place), 2) the percentage of original oil in-place that has been produced, and 3) the quality of the oil (i.e., its API gravity). Because most giant fields that are the target of significant exploration activity produce middle gravity oil, our analysis below focuses on the first two metrics.

These two metrics can be applied using two different perspectives. One focuses on the relative size and age of conventional oil fields operating in the United States relative to the rest of the world. The other focuses on the "frontier" for finding new giant oil fields,[1] with the understanding that these new fields will generally be the lowest cost opportunities for an incremental conventional oil production.

From the first perspective, all of the giant U.S. onshore lower-48 oil fields were found between the late 1800s and 1940. Most of these fields have produced most of the recoverable oil in-place, and, in all cases, these giant oil fields are now producing oil using tertiary production methods (i.e., the injection of steam or carbon dioxide to produce oil), which is the most expensive means of producing oil.[2] In contrast, Alaska oil production should be somewhat less expensive to produce than onshore lower-48 production because most of the giant fields found on the North Slope were discovered in the late 1960s and early 1970s, and because they haven't produced as much of the original oil in-place (because they have not been in production anywhere near as long as the giant onshore lower-48 fields).

In contrast to the U.S. onshore lower-48, most of the giant fields producing overseas were discovered much later so they have not produced as much of their original oil in-place, both because of their relative age and because of OPEC production constraints. In the Middle East, most of the giant oil fields were discovered in the late 1940s through the 1970s, and the average giant field size is much larger than the giants fields found in the U.S. onshore lower-48. Most of the giant Russian oil fields were also discovered in the late 1940s through 1970s time frame, but the production costs should be higher than in the Middle East both because the average field size is smaller and because a larger percentage of the original oil in-place has been produced.

From the "frontier" perspective, exploration companies are primarily searching for and finding giant oil fields located in the offshore deepwater regions of the Gulf of Mexico, West Africa, Brazil, Northwest Australia, and Malaysia/Indonesia. So generally one would expect these to be the incremental oil fields with the lowest production cost.

The production costs of most non-conventional liquids are typically higher than the production costs from conventional sources. For example, the production costs are: $10 to $15 per barrel for ultra-heavy oil, $10 to $20 per barrel for oil sands, and $25 to $30 per barrel for gas-to-liquids. The range of production costs for coal-to-liquids and shale oil are likely to be higher than those for the other non-conventional liquids production costs cited above.

Because investments in oil shale and coal-to-liquids are capital-intensive, investors would need to expect a long period of consistently high crude oil prices before they could expect to earn a return on their investment. A recent study by Mitretek (2003) estimated that a flat world oil price of $42 per barrel (2004 dollars) would make current coal-to-liquids technology economic. Allowing for the revenues associated with cogenerated electricity could lower the required price.

Based on data obtained from the Federally-funded oil shale demonstration plants of the 1970s, capital investment in shale oil processing becomes economic with current technologies when world oil prices exceed about $70 per barrel (2004 dollars).

Of course, technological breakthroughs could alter the economics and the likelihood of production from non-conventional sources. For example, Shell Oil is cur-

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[1] In the petroleum industry, a "giant" oil field is defined as having 500 million or more barrels of oil that can be produced over the life of the field.

[2] "Primary" production refers to oil that is produced without injecting water, steam, or carbon dioxide. "Secondary" production refers to oil produced with the assistance of water injection.

rently testing an in-situ oil shale process in the Rocky Mountains that it hopes will be profitable at about $30 per barrel of petroleum liquids. The Shell process, however, is still in the experimental stage, so there is considerable uncertainty whether this process will prove to be technically and economically feasible.

Question 6. Secretary Bodman, the President's FY 2007 budget eliminates funding for the Geothermal Energy Program. Please explain the type and scope of R&D that will not happen due to this decision. How many FTEs will this decision impact? Doesn't the program need some funding for closeout costs? Please describe the geothermal resources and potential in Washington state.

Answer. In FY 2007, all geothermal program R&D activities will be closed out. These include exploration, enhanced geothermal systems, drilling, energy conversion, cost-shared exploratory drilling, and power plant field verification. DOE plans to reassign all federal geothermal personnel to other programs. The geothermal program has achieved its key technical objectives. Geothermal is now a mature energy technology. The Department has not requested any funds for closeout, because it plans to use the program's uncosted and carryover funds for closeout.

The U.S. Geological Survey in Circular 790 states that Washington State has an electrical potential of 27 megawatts electrical from higher-temperature resources. In addition, the U.S. Geological Survey in Circular 892 estimates that Washington State's low-temperature resources could provide 450 megawatts thermal of beneficial heat. A map of Washington's geothermal resources can be found at *http://geothermal.inel.gov/maps/index.shtml.*

Question 7. Secretary Bodman, the President's FY 2007 budget eliminates funding for the Hydropower research program. I understand that this is part of a multiyear closeout effort. Please describe the history of this program, how much federal funding went to this program since its inception, the program's measurable results, and what technologies were transferred and/or adopted in our nation's hydropower infrastructure. Did any dams in Washington state directly benefit from this program?

Answer. The Department's Hydropower Program was established in 1977. In the 1970s, the Hydropower Program focused on small hydropower technology assessment and strategic planning. In the 1980's, activities expanded substantially into a Small Hydropower Loan Program, plus resource assessment and analysis of environmental, economic, and policy issues facing new hydropower development. After several years of zero funding (fiscal years 1988-1990), the Hydropower Program reformed with a focus on new technology development to improve the environmental performance of hydropower projects. From 1994 to the present, the Hydropower Program has been focused largely on Advanced Turbine research, but it did expand further into new research topics like wind energy and hydropower integration. The total funding since inception was approximately $128 million ($49 million of that was in fiscal years 1979 and 1980 when the Small Hydro Loan Program was operating).

Under the Small Hydro Loan Program (1978-1985), 20 new projects were developed with a total installed capacity of 133 megawatts in 18 states. More than two dozen guidance manuals, resource assessments, and technical analyses were produced in that early phase of the program, all related to small-scale hydropower development.

Since the Hydropower Program was restarted in 1990, the major accomplishments and technology transfers were:

- Conceptual designs for four types of advanced hydropower turbines.
- Completed laboratory scale prototype testing of the new design fish-friendly Alden turbine. This design was made available to industry to be considered for a full scale demonstration project.
- Completed two years of full-scale testing of aerating Francis turbines at the Osage Project in Missouri. Results of these tests were made available to industry for consideration in addressing water quality issues at other locations.
- Completed one year of full-scale testing of a second-generation Minimum Gap Runner turbine at Wanapum Dam in Washington, with Grant County Public Utility District (PUD) and Voith Siemens. This turbine design is now available to industry and being considered for deployment at other hydropower sites.
- Developed new biological design criteria and new methods to measure environmental performance, applicable to new turbines.
- Completed a full assessment of the undeveloped hydropower resources in the United States, providing industry with the necessary tools to evaluate development of these hydropower resources.
- Produced numerous other research reports on subjects including mitigation effectiveness of fish passage, dissolved oxygen, and instream flow requirements.

An advanced fish-friendly hydropower turbine resulting from the Hydropower Program's advanced turbine research was installed at the Wanapum Dam in Washington (Grant County PUD). Testing of this turbine was cost shared between the Department and Grant County.

Under the Small Hydro Loan Program in the 1980's, 8 feasibility loans and 3 licensing loans were made to developers in Washington. The City of Spokane received funding from the Department to add capacity to their existing hydropower plant.

Question 8. Secretary Bodman, I believe harnessing the ocean's abundant thermal and mechanical energy holds considerable long term promise as a clean, distributed, and renewable energy resource. In fact, since the mid 1990's there has been a worldwide resurgence in wave energy, led primarily by small engineering companies who have developed and deployed new devices that represent a significant improvement over older concepts. Currently, over a 100 technologies have been developed that capture the energy of ocean waves, tides, or thermal variation. Please explain why DOE does not fund or support any research into this promising energy source. Are there any plans to do so in the future? Is the U.S. likely to fall behind other countries active in wave and thermal energy?

Answer. The Department is supporting a small amount of R&D with two companies, one focusing on ocean current and the other on wave energy technology, via the Small Business Innovation Research Program. We are also actively collaborating with the Electric Power Research Institute and the International Energy Agency to monitor domestic and worldwide progress in these technologies to ensure the U.S. government is aware of developments pertinent to assessing the appropriate consideration of federal investment in ocean energy R&D.

The Department periodically evaluates its R&D programs to ensure that promising energy technologies are supported where appropriate and consistent with the Administration's R&D investment criteria. While some countries with higher resource potential, relative to their overall energy needs, are active in ocean energy R&D, the technology is still in its infancy, with a small number of demonstration systems operating worldwide.

Question 9. Secretary Bodman, the President's budget request chose to cut EERE's Vehicle Technologies Program by 9 percent, down to $166 million. Please describe what affect these cuts will have on ongoing R&D. What affect these cuts will have on the program's GPRA measurements, or in the estimated amount of oil savings attributable to this program?

Answer. Transportation research remains a key factor in our plans to decrease the Nation's dependence on foreign oil, and DOE's request strongly supports this goal. Although it appears that we are asking for less money in the Vehicle Technologies Program, a closer look at the details shows that the FY 2006 appropriation contains more than $20 million in congressionally directed activities that do not support the Vehicle Technologies Program's mission and goals. Once an adjustment is made for earmarks and program transfers, it becomes clear that DOE's FY 2007 budget request for goal-directed R&D is level with the FY 2006 appropriation. Additionally, this year's request realigns some internal priorities by placing greater emphasis on those research activities with the greatest potential for oil savings, particularly to increase funding for the development of lithium-ion batteries and other technologies for plug-in hybrid vehicles. Because of the R&D realignments, the Vehicle Technologies GPRA and estimated oil savings should improve.

Question 10. Secretary Bodman, the budget request states that new technologies "will reduce the volume of high level waste from spent nuclear fuel and reduce the radiotoxicity of spent nuclear fuel." In March last year, DOE (William Magwood) stated in testimony to the House Appropriations Subcommittee on Energy and Water Development that DOE has doubts whether the reprocessing technologies under consideration can ever be made "proliferation-resistant and economically viable." What technologies must be developed to reduce the radiotoxicity in the high-level waste? What new discovery has been made or advanced that now makes it likely that these technologies will be commercially viable? What is DOE's estimated time-line for developing these reprocessing technologies?

Answer. The principal sources of radiotoxicity in used nuclear fuel are the transuranic elements in the waste. For example, performance assessments of the very long-term releases of radionuclides from Yucca Mountain have identified neptunium-237 as the main source of possible future exposure. Neptunium along with the other transuranics (mainly plutonium) would be consumed in future fast reactors with the production of useful energy. The resulting fission products contained in a well-designed inert matrix-like glass would be much less hazardous in a repository than used fuel.

Separation and recycle of the transuranic elements plutonium, neptunium, and americium reduces radiotoxicity, hypothetical dose from waste emplaced in a reposi-

tory, and the heat load to the repository. Separation of uranium reduces the volume of the waste emplaced in a repository. The new separation techniques UREX+ (for existing used fuel) and pyroprocessing (for candidate fast reactor fuels) are designed to ensure recycle of these elements, whereas the 60-year old PUREX separation technique only recovers plutonium and uranium. Both UREX+ and pyroprocessing are intended to be more economic than PUREX (in part by reducing geologic repository requirements, in part by learning from past technologies, in part by operating UREX+ in a continuous fashion instead of the batch processing of PUREX) and more proliferation resistant than PUREX (by making separated material more difficult to handle and less weapon-usable than pure plutonium, and by incorporating safeguard technologies directly into design). Past laboratory-scale results are promising; more detailed and larger scale experiments are now warranted.

The present inventory of commercial used nuclear fuel exceeds 50,000 metric tons and accumulation of used fuel will probably pass the statutory limit of 70,000 metric tons before Yucca Mountain opens. One concern associated with an expansion of nuclear energy in the U.S. is the possibility of needing many repositories. The potential that used fuel recycle could delay for at least a hundred years the need for a second repository provides in itself a commercial incentive (since used nuclear fuel disposal is paid for by nuclear electricity customers). Further, a commercial recycle facility in the U.S. would probably need to have an initial capacity of at least 2,500 metric tons per year, for which automation and advanced instrumentation could reduce unit costs well below those for current reprocessing plants. Finally, the increasing world demand for uranium has begun to increase its price, a trend expected to continue indefinitely. Commercial viability may be possible within several decades, a period during which engineering scale testing of the basic components of the U.S. involvement in the Global Nuclear Energy Partnership would be carried out.

DOE has set goals of about 2011 for operation of an engineering scale demonstration of UREX+, 2014 for initial operation of a test reactor that would operate initially with conventional fuels, and 2016 for a fuel cycle facility capable of producing the first fuels for use in the actinide based test reactor.

Question 11. Secretary Bodman, France, which has reprocessed its spent fuel, must now find a repository for its spent MOX fuel, which is thermally hotter than our light water reactor spent fuel and thus more difficult to manage. How did reprocessing help France deal with its spent fuel? What is the international experience with fast reactors? Given that DOE's program assumes building a new generation of fast reactors that would transmute the plutonium, what is DOE's time-frame for developing and building these reactors?

Answer. The French Mixed Oxide Fuel-recycling program is based on plutonium-only separation using the PUREX technology and is aimed at modest energy recovery from the plutonium and improved waste management. Thermal recycle in France decreases the ratio of fast reactors to advanced thermal reactors needed to stabilize and ultimately eliminate plutonium and the minor actinides from the high level waste. The ultimate waste form in France, is glass that is much more resistant to leaching than the once-through fuel spent fuel, thus reducing the technical requirements for repository design. No country sees recycle as a way to eliminate the need for a geologic repository. Those who do recycle believe it improves repository performance.

The international experience with fast reactors includes:

- More than 30 years of experience with the French 560 MWt Phenix fast reactor
- Thirty years of experience in the United States with the EBR-II fast reactor
- Thirty years with Japan's 100 MWt Joyo fast reactor
- Thirty years with Russia's 1000 MWt BN 350 reactor
- Twenty-five years with Russia's 1470 MWt BN 600 reactor
- Thirteen years of experience with the U.S. 400 Mwt Fast Flux Test Facility
- Thirteen years of experience with France's 2900 Mwt Superphenix reactor

The Department's plan for demonstration of fast reactor technology for consuming transuranics calls for demonstrating the technology in the 2014 timeframe with commercial deployment after 2025.

Question 12. Secretary Bodman, the budget request puts a priority on developing the reprocessing technologies, while virtually ignoring the question of fast reactors—the key technology needed to actually reduce the radioactivity of the waste. How will reprocessing solve the waste problem if we don't have fast reactors? The world already has more than 100 tons of "orphan" separated plutonium. Would it not make sense to see first whether the reactors can be commercialized before creating more plutonium?

Answer. Recycling, fuel, and reactor technologies are mutually supporting and need to be developed in a sequence that ensures that the necessary parts will be

in place at the time they are needed. Three major projects need to be developed and demonstrated to confirm the application of advanced recycle technologies for commercial light water reactor used fuel cycle. These are: 1) the Engineering Scale Demonstration (ESD) of the UREX+ separation process, 2) the Advanced Fuel Cycle Facility (AFCF) to develop transmutation fuel for the test reactor, and 3) the Advanced Burner Test Reactor (ABTR) to confirm transmutation of the highly radioactive material contained in used fuel. Successful demonstration of these technologies would represent the demonstration of a proliferation-resistant, closed fuel cycle.

The major technical challenges are in the areas of the separation of used nuclear fuel, the manufacture of new fuel from recycled products, and the destruction of the long-lived radioactive materials in a nuclear reactor. These challenges are key to dealing with the waste problem, and will be addressed both through continued research in the laboratory and new demonstration facilities. An ESD of the separations technology will demonstrate continuous operations of an integrated separations process containing a series of solvent extraction steps using different solvents to demonstrate safe and effective waste and storage forms for materials with high heat generation. All scenarios require demonstration of UREX+ to separate existing used U.S. nuclear fuel, hence the importance of the ESD; there is no reason to delay moving forward with UREX+ for treatment of existing light water reactor fuel.

The AFCF would be pursued to develop remote fuel fabrication processes for fast reactor recycle fuel containing significant amounts of highly radioactive materials that can be used as fuel in fast reactors. An ABTR will be developed to demonstrate effective transmutation of the highly radioactive materials separated out from used nuclear fuel, and produce electricity at competitive rates. The missions for both AFCF and ABTR include examination of several fuel and reactor-detail variations.

REPROCESSING TECHNOLOGIES

Question 13. Secretary Bodman, you stated that the DOE will increase its current request of $250 million for GNEP in FY 2008. How much will the DOE request next year and in the next five years? Do you believe the U.S. nuclear industry will be willing to pay for these new, more expensive reactors?

Answer. The department is preparing a revised program plan to delineate the technology demonstration work scope and funding requirements over the next five years. This plan, to be issued in May 2006, will incorporate recommendations from technical and project management experts who have reviewed the detailed technology plan that provides the basis for the FY 2007 budget request.

We would expect U.S. industry to make their decisions based on the economics of deploying the new technologies. The GNEP approach envisions that current types of nuclear power plants (light water reactors) would remain in the majority; new Advanced Burner Reactors would be a minority of nuclear power plants. Sufficient ABRs would be needed to consume transuranic elements from used fuel. If ABRs were to be found more expensive to build and operate than light water reactors, the overall economics would need to reflect their consumption of long-lived transuranics, thereby conserving costly geologic repository capacity; each ABR would essentially lessen the need of additional geologic repository capability. Another approach could be to put in place governmental incentives to "burn" long-lived transuranics in ABRs.

Question 14. Secretary Bodman, since the administration has requested funding to continue retrievals in the C-Tank Farm in 2007, will you acknowledge that the Department will miss the September, 2006 Tri-Party Agreement milestone (M-45-00B) to complete retrievals from all 16 single shell tanks in the C-Tank Farm?

Answer. While most subparts of Milestone M-45-00B have been or will be met by the close of FY 2006, some elements will not be met (i.e., completing retrieval of all 16 C-Farm tanks and test of the mobile retrieval system). The double-shell (DST) tank system currently has limited capacity to receive waste from the single-shell tanks (SSTs), and that is anticipated to be the case until treatment can be provided by the Waste Treatment and Immobilization Plant (WTP), the construction and ultimate start of operations of which is delayed. Consistent with Appendix I to the Hanford Federal Facility Agreement and Consent Order, the Department of Energy (DOE) will seek to negotiate revised SST retrieval milestones with the Washington State Department of Ecology that will take into account the reduction of short-term and long-term risk to the environment, optimization of feed to the WTP, and optimization of DST space utilization.

Question 15. Secretary Bodman, will the Department please list when it will complete the activities included in the (M-45-00B) milestone?

Answer. Milestone M-45-00B includes many subparts such as retrieval technology testing, leak detection system testing, submittal of Tank Waste Retrieval Work Plans, and specific tank retrieval actions. Virtually all of the subparts of M-45-00B have been completed or will be completed by the end of FY 2006, as scheduled, with the exception of testing the mobile retrieval system (MRS) and completing the retrieval of all 16 tanks in C tank farm. MRS testing will be conducted in FY 2007. Consistent with Appendix I to the Hanford Federal Facility Agreement and Consent Order, the Department of Energy (DOE) will seek to negotiate revised single-shell tank (SST) retrieval milestones with the Washington State Department of Ecology that will take into account the reduction of short-term and long-term risk to the environment, optimization of feed to the Waste Treatment and Immobilization Plant (WTP), and optimization of double-shell tank (DST) space utilization. DOE is scheduled to provide a date for when the WTP will be on-line during summer 2006. Once this information is available, it will be used to more accurately plan rates of SST retrievals prior to the start of WTP operations.

Question 16. Secretary Bodman, can the Department please list what tank activities will be completed with fiscal year 2006 appropriations?

Answer. Tank Farm planned accomplishments for FY 2006 include the following:

- Complete four single-shell tank (SST) waste retrievals;
- Complete the Remote Water Lance Demonstration in SST S-112;
- Complete final design of the Demonstration Bulk Vilification System; project including completion of an External Independent Review;
- Complete two full-scale melt tests using tank waste simulants;
- Complete construction of the Integrated Disposal Facility;
- Complete the Double-Shell Tank System Integrity Assessment Report;
- Complete the upgrade of the AP-106A Central Pump Pit; and,
- Complete the upgrade of the 241-SY-B Valve Pit.

Question 17. Secretary Bodman, can the Department please list what tank activities will be completed, assuming the level of appropriations in the administration's fiscal year 2007 request?

Answer. Tank Farm planned accomplishments for FY 2007 include the following:

- Maintain the Hanford Tank Farms in a safe and environmentally compliant condition;
- Continue single-shell tank (SST) waste retrievals at a reduced pace due to the delayed start (2016-2018) of the Waste Treatment and Immobilization Plant operations;
- Continue double-shell tank (DST) sampling to maintain chemistry control;
- Maintain the Integrated Disposal Facility in an operational readiness mode; and,
- Complete one evaporator campaign to provide additional DST capacity for SST retrieved waste.

Question 18. Secretary Bodman, on page ES-3 of the Army Corps of Engineers "Independent Review of Waste Treatment Plant (WTP) Estimate at Completion (EAC) 2005," dated May 13, 2005, the report says, ". . . if seismic threats exist, it is imperative the project be accelerated to empty tanks as soon as possible (tanks and their contents represent the immediate risk in a seismic event) . . ." In your testimony before the committee today, you disagreed with the report's assessment of tank-related seismic risk. Can you please explain what scientific basis or analysis your disagreement with the report is based on?

Answer. Robert L. Cloud & Associates, Inc., prepared a report, RLCA/P286-02-01-96/001, for the Department of Energy (DOE) on December 6, 1996, for the "Evaluation of Hanford High-Level Waste Tank Failure Modes for Seismic Loading". The analysis indicated the single-shell tanks and double-shell tanks would withstand seismic loads per the DOE's criteria and guidelines for earthquake events.

Question 19. Secretary Bodman, the State of Washington has informed me that a soon to be completed "Double Shell Tank System Integrity Assessment." will state that the Double Shell Tank system will meet new seismic requirements at the Hanford Site. Are you aware of this report and its preliminary findings?

Answer. Yes. The double-shell tanks (DSTs) were evaluated using the updated seismic spectra developed for the Waste Treatment and Immobilization Plant. All 28 DSTs were also examined using remote ultrasonic tests and visual inspections. The analyses indicate that the tanks are fit for continued use and will successfully withstand expected seismic events. The findings will be documented in a report titled "DST Integrity Assessment" that is planned to be issued on March 31, 2006.

Question 20. Secretary Bodman, according to the State of Washington current plans include using storage capacity in Hanford's double shell tanks to store waste

from the C-Tank farm until the waste is vitrified. The State of Washington also believes there is enough available storage capacity for the C-Farm tank waste in double shell tanks. Can you please provide in writing how much capacity is available in the double shell tanks and current plans to use that available capacity?

Answer. The double-shell tank (DST) system has limited capacity to receive wastes from the single-shell tanks (SSTs), and that is expected to continue to be the case until treatment can be provided by the Waste Treatment and Immobilization Plant (WTP). DST capacity numbers fluctuate as retrieved SST wastes enter the DSTs and as DST wastes are concentrated through evaporator campaigns. The DSTs currently have approximately 2.5 million gallons of capacity that could be used to receive SST wastes. SST waste retrievals will continue at a sustainable rate with the available DST capacity until WTP feed operations commence. As a result, DOE will be able to maintain procedures, processes, operational proficiency, and corporate knowledge at levels required to safely conduct SST retrievals and enable a smooth transition to the higher rate of SST waste retrievals that will be required when the WTP commences processing waste from the DST system. Consistent with Appendix I to the Hanford Federal Facility Agreement and Consent Order (commonly referred to as the Tri-Party Agreement), DOE will seek to negotiate revised SST retrieval milestones with the Washington State Department of Ecology that will take into account the reduction of short-term and long-term risk to the environment, optimization of feed to the WTP, and optimization of DST space utilization. DOE is scheduled to provide a date for when the WTP will be on-line during summer 2006. Once this information is available, it will be used to more accurately plan rates of SST retrievals prior to the start of WTP operations.

Question 21. Secretary Bodman, are you aware of any studies that suggest waste from Hanford has contaminated groundwater, the Columbia River, or negatively impacted fish and wildlife populations?

Answer. I am aware of several studies that show waste from historical Hanford operations reached the groundwater under the Hanford Site and this groundwater eventually makes its way to the Columbia River. The Department of Energy and the Washington State Departments of Ecology and Health are concerned and carefully monitor contaminants. They have observed no impact to fish and wildlife populations. We publish comprehensive results of our environmental monitoring to make them publicly available. (The most recent report is "Hanford Site Environmental Report for Calendar Year 2004, PNNL-15222.)

Question 22. Secretary Bodman, the Department has been testing an alternative technology at Hanford, known as "bulk vitrification" for the last few years. I understand if proven successful through testing, bulk vitrification could allow waste to be treated sooner—making more space available in double shell tanks. However the administration's budget includes the following language in explaining the $52 million cut to the tank waste program, "Decrease is due to the curtailment of work on the Bulk Vitrification Demonstration System which includes not proceeding to construction and not completing up to 50 waste boxes, and further reduction in Single-Shell Tank retrievals." Is the Department still committed to completing the bulk vitrification testing process? If not, please list what other alternative tank waste treatment technologies are being considered by DOE?

Answer. The Department of Energy (DOE) is committed to developing a Bulk Vitrification cost and schedule baseline that can be used to determine whether full Demonstration Bulk Vitrification System (DBVS) Project tests should be conducted. The DBVS Project is currently at approximately 70 percent design completion. In FY 2006, the DOE's plan is to complete the DBVS design, validate project costs, complete two full-scale cold tests at the vendor's Richland, Washington, site, and develop a project cost and schedule baseline that will allow the DOE to make a decision on the path forward for DBVS. The schedule for moving forward with DBVS will be developed as part of the project baseline.

Possible alternatives to using Bulk Vitrification as a supplemental technology for low-activity wastes (LAW) include increasing the through-put of the Waste Treatment and Immobilization Plant (WTP) LAW vitrification facility currently being constructed using higher capacity or additional melters, or using an alternative (non-glass) waste form that meets the criteria for on-site disposal.

Question 23. Secretary Bodman, can the Department please provide an accounting of all appropriated funds spent on the Bulk Vitrification Pilot Project?

Answer. Spending by fiscal year on the Demonstration Bulk Vitrification System is as follows:

	$ in millions
FY 2004	19.084
FY 2005	38.139
FY 2006 (to date)	8.411
FY 2006 (balance)	17.183

Question 24. Secretary Bodman, I have been very supportive of the GridWise program, in particular the Northwest Demonstration project which is just underway in Washington and Oregon. This budget proposal zeroes out the GridWise program and according to the budget footnotes, moves it into a new account. The Pacific Northwest National Laboratory (PNNL) is a national leader in this area of research I want to be assured that the Department will continue this program just as PNNL is about to gather data and provide solutions to managing the grid systems more efficiently during peak times. Can you provide that assurance?

Answer. DOE has been particularly pleased with the leadership that the Pacific Northwest National Laboratory (PNNL) has provided with regard to research and development in support of the Electricity Delivery and Energy Reliability Office's vision to modernize the electric delivery system in this country. I assure you that the programmatic changes we've proposed in the FY 2007 budget allows for continued support of critical research and development (R&D) needed to prove the viability and impact of innovative new technologies and systems consistent with the focus of exploring Information Technology solutions to improve the overall reliability, efficiency, security, and cost of the electric delivery system. Our R&D portfolio is based on substantial input from both industry and our national laboratories and represents some of the highest priority needs that have been identified. We will continue to work with PNNL and industry leaders to ensure that these efforts continue to be relevant and an appropriate priority for DOE.

RESPONSES TO QUESTIONS FROM SENATOR CRAIG

Question 1. Is the DOE committed to resuming the capability to produce PU 238 for space missions?

Answer. The Department of Energy (DOE) is proceeding with the conceptual evaluation of reestablishing a domestic plutonium-238 (Pu-238) production capability as part of DOE's proposed Pu-238 Consolidation Project but has not committed to establishing the capability. Such a commitment will require a definitive expression of need for additional Pu-238 from the Federal agencies that use radioisotope power systems and heat sources for national security and space exploration missions.

Question 2. Can you assure me that all DOE laboratories, not just the Office of Science Labs, will be utilized as part of the proposed increased investment in science and education?

Answer. While that portion of our budget used to operate research facilities (open to both industry and universities) is necessarily directed to the laboratories that house those facilities, our research funding goes to the best competitively solicited proposals, as determined through peer review. All DOE laboratories, as well as university and other researchers outside of DOE, are welcome to compete for these funds.

Question 3. When should Congress expect to receive the Nuclear Energy Research Advisory Committee (NERAC) report on the Next Generation Nuclear Plant?

Answer. The NERAC approved the report on the Next Generation Nuclear Plant at its meeting on February 22, 2006. The Department expects that NERAC will submit the final report to the Department shortly and the Department expects that the report will be delivered to Congress by the April 2006 deadline specified by the Energy Policy Act of 2005.

Question 4. Please provide the information used by DOE to support its decision to eliminate funding for geothermal research and development.

Answer. The geothermal program has achieved its key technical objectives. Geothermal is now a mature energy technology. New geothermal projects in the United States are planned for California, Nevada, Idaho, Alaska, Hawaii, Utah, and Arizona. There are 483 megawatts of new power purchase agreements signed in California, Nevada, Idaho and Arizona. Projects under construction, or which have both Power Purchase Agreements and are undergoing production drilling, amount to 547 megawatts in the seven western states. The Western Governors Association geothermal task force recently identified over 100 sites with an estimated 13,000 MWe of power with near-term development potential.

The highest priority of the geothermal industry has been the attainment of the production tax credit, which the passage of the Energy Policy Act of 2005 provided. In addition, the Energy Policy Act streamlined geothermal leasing and changed the royalty structure to provide incentives for local governments to promote geothermal development. The Energy Policy Act also mandated that the U.S. Geological Survey update maps providing detailed geothermal resource data. Together, these statutory changes will spur geothermal development without the Department's Geothermal Program.

Question 5. Please provide the information used by DOE to support its decision to zero out hydroelectric research and development—including R&D for small hydropower facilities and fish-friendly technologies

Answer. The Department has concluded that industry now has the ability to improve turbine efficiency while lowering fish mortality without further Federal investment. The Department successfully completed testing of large fish-friendly hydropower turbines in fiscal year 2005, consistent with congressional direction over the past several years. For FY 2006, the Department requested $500,000 for hydropower research to close out the program.

With regard to small hydropower, the Department completed an assessment of undeveloped U.S. hydropower resources, the technologies needed to develop the resources, and the feasibility of developing the resources. The Department believes it has provided industry with the necessary tools to evaluate development of these hydropower resources, and pursue development through the normal hydropower permitting process.

Question 6. Please provide the information used by DOE to support its decision to eliminate funding for Nuclear Engineering Education in the Office of Nuclear Energy's University Support Program.

Answer. The decision to eliminate funding for Nuclear Engineering Education in FY 2007 is based upon the recognition that undergraduate enrollments have rebounded from lows reached in the mid and late-1990s. Universities are now in a stronger position to support nuclear engineering programs and seek additional assistance that may be required from the nuclear industry, which has a large stake in maintaining the now-revitalized nuclear engineering education infrastructure.

Question 7. Does DOE plan to implement recommendations by the National Research Council in the pending WGA Geothermal Task Force Report, and if so, how?

Answer. DOE has not assessed the recommendations from the still-draft WGA report, but intends to do so when the report is issued in final form.

Question 8. Has the Department followed through on the request by Idaho's Geothermal Program Manager to approve a National Research Council review of that program?

Answer. The Department followed through on the Program Manager's request for an NRC review of the program and determined that a more focused and technical analysis specifically on Enhanced Geothermal Systems (EGS), the program's key technical priority, would be more appropriate. EGS has significant potential to increase geothermal resources. Therefore, the program is currently supporting an independent external technical feasibility study of EGS.

RESPONSES TO QUESTIONS FROM SENATOR DOMENICI

AMERICA'S COMPETITIVENESS

Question 1. As I noted earlier, I am very excited about the President's initiative to enhance America's competitiveness. I've introduced, along with Senator Bingaman, Senator Alexander and numerous other co-sponsors, three bills to promote this initiative, one of which you will be charged with implementing.

- Please outline for us your plan for implementing this initiative.
- Are you committed to seeking continued funding for these programs?

Answer. The Administration is assessing the provisions of S. 2197, the Protecting America's Competitive Edge through Energy Act of 2006—also known as the PACE-Energy Act—which you introduced on January 26th.

The President's American Competitiveness Initiative (ACI), unveiled in his State of the Union message, demonstrates the President's strong commitment to continued U.S. competitiveness through a renewed national effort in basic scientific research, private sector investment incentives, and math and science education. This commitment is reinforced in the President's FY 2007 budget which proposes substantial increases in these areas. The FY 2007 budget for DOE's Office of Science programs, for example, includes a $505 million increase, which is the beginning of a ten-year commitment to double the total funding for certain high-leverage science agencies.

The Administration welcomes the opportunity to discuss with Congress all aspects of S. 2197 and its companion bills, and to work with you to find the best ways to achieve our shared goals of education excellence and global economic competitiveness.

ELECTRICITY/FEDERAL ENERGY REGULATORY COMMISSION

Question 2. Please comment on one of the key provisions of the Electricity Title, Section 1221, Siting of Interstate Electric Transmission Facilities. What is the status of the designation of National Interest Electric Transmission Corridors?

Answer. Section 1221 authorizes the Secretary of Energy to designate any geographic area experiencing electric energy transmission capacity constraints or congestion that adversely affects consumers as a National Interest Electric Transmission Corridor (NIETC). Any such designations will be based on a study of electric transmission congestion and alternatives and recommendations from interested parties, including affected states and any appropriate regional entity. The Department is conducting a congestion study, which will be published in August 2006. On February 2, 2006, the Department published a Notice of Inquiry which described its plan for the congestion study, sought comments from the public on draft criteria for the designation of NIETCs, and invited interested parties to identify areas where they think NIETCs are urgently needed. *See Considerations for Transmission Congestion Study and Designation of National Interest Electric Transmission Corridors,* 71 Fed. Reg. 5660 (Feb. 2, 2006). The comment period for the notice closed March 6, and the Department will host a technical conference March 29 to discuss concerns raised in the comments. The Department expects to propose and then designate NIETCs on an "as appropriate" basis based on the results of the congestion study and any comments on the notice of inquiry.

Question 3. There have been several news reports about recent exciting transmission investment efforts, such as the Frontier Line originating in Wyoming and AEP's plans for new 765-kilovolt transmission line stretching from West Virginia to New Jersey. Will these efforts be able to take advantage of DOE's authority to designate National Interest Transmission Corridors?

Answer. The Department notes the geographic breadth of these proposals and the large amount of new transmission capacity that they would add to the systems in their respective regions. We are in the process of developing the criteria that we will use to assess the suitability of particular geographic areas for designation as National Interest Electric Transmission Corridors. We expect to examine these proposals in terms of these criteria. If we conclude that designation of corridors in such areas is in the national interest and consistent with Section 1221, we will issue the designations.

POWER MARKETING ADMINISTRATIONS—AGENCY INTEREST RATES FOR SEPA, SWPA AND WAPA

Question 4. The budget proposes the assign "agency" interest rates to the PMAs for new obligations. The Administration estimates that this proposals will increase revenue to the U.S. Treasury by $2-3 million annually, beginning in FY 2007.

The budget submission calls for estimated rate impacts of 1%. What assurances do preference customers have that OMB will not make administrative adjustments each year that, in the long term, make PMA power above market?

Answer. The budget process is an annual process. No decisions have been made about what may or may not be proposed in future budgets. Under current law, the PMAs' power rates must be cost-based.

HYDROPOWER

Question 5a. The President's FY 2007 budget proposes to terminate the DOE Hydropower Program (−$500,000) and transfer the research, development, and demonstration results to industry. DOE's Hydropower program is a joint program between DOE and the hydropower industry. The program has mainly focused on the Advanced Hydropower Turbine Systems (AHTS), which is designed to improve fish passage, increase hydropower project efficiency, and result in power output increases.

It is my understanding that turbine runners developed by this program to benefit juvenile salmon survival in the West have shown great promise, with a 98% survival rate for juvenile fish passing through the Grant County PUD's dam. This program is now in the final Stage III phase. Why does DOE want to short-change the maximum results of Phase III?

Answer. The Department has concluded that industry now has the ability to improve turbine runner design and address fish survival rates without further federal

investment. The Department successfully completed testing of large fish-friendly hydropower turbines in fiscal year 2005, consistent with congressional direction over the past several years. For fiscal year 2006, the Department requested $500,000 for hydropower research to close out the program.

Phase III of the Advanced Hydropower Turbine System program was to build and test, to scale, prototypes of the—most promising hydropower turbine models in actual hydropower plants. Two tests were completed, including the Grant County Public Utility District Wanapum Dam.

Question 5b. Does the Department believe this Program has achieved useful results? Is industry likely to continue this Program in light DOE's withdrawal from it?

Answer. The Department's Hydropower Program has achieved useful results. Two hydropower turbine designs aimed at improving the environmental performance of hydropower plants were developed and successfully tested, with results available to industry. The Program also completed a full assessment of the undeveloped hydropower resources in the United States, as an aid to the future development of additional renewable resources.

The Department has concluded that industry now has the ability to continue improving turbine efficiency while lowering fish mortality without further Federal investment, and will use the advanced turbine designs to improve efficiency and environmental performance at existing hydropower sites.

Question 5c. Is DOE currently the only Federal agency engaged in researching hydropower's role as a low-cost, renewable, domestic source of clean energy?

Answer. No, other agencies conducting hydropower research include: the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, Bonneville Power Administration, Western Area Power Administration, and Tennessee Valley Authority.

Question 5d. The DOE hydropower program supports the important work of the national labs in the field of hydropower. What are DOE's plan for maintaining this hydropower knowledge base at the laboratories?

Answer. Archives of all important results from the Hydropower Program will be electronically available on the hydropower web site hosted by the Idaho National Laboratory.

ENERGY POLICY ACT—HYDROPOWER R&D

Question 6. The Energy Policy Act of 2005 (Title IX, Section 931) directs DOE to conduct a research, development, demonstration and commercial application program for cost competitive technologies that enable the development of new and incremental hydropower capacity.

Given this Congressional directive, please explain why the Administration has proposed to terminate the DOE hydropower program.

Answer. The Department has concluded that industry now has the ability to improve turbine efficiency while lowering fish mortality without further federal investment. The Department successfully completed testing of large fish-friendly hydropower turbines in fiscal year 2005, consistent with congressional direction over the past several years.

STRATEGIC PETROLEUM RESERVES

Question 7a. Please comment on the timetable, status, and site selection process for meeting the mandate in the Energy Policy Act of 2005 to expand, as "expeditiously as practicable" the SPR capacity from 700 million barrels to 1 billion barrels of crude oil.

Answer. The Energy Policy Act of 2005 requires us to complete a process to select sites necessary for the expansion of the SPR to one billion barrels by this August. The SPR expansion would be a major Federal action, requiring the preparation of an Environmental Impact Statement under the National Environmental Policy Act (NEPA), before making a decision on site selection.

The Department issued a Notice of Intent to prepare an Environmental Impact Statement for the selection of sites for the expansion of the SPR on September 1, 2005. The SPR Office has identified the candidate sites and completed public scoping meetings in Lake Jackson, TX, Houma, LA, Jackson, MS and Port Gibson, MS. The Department is also engaged in the preparation of conceptual designs and geotechnical analyses of the candidate sites. All this is required prior to site selection.

The timetable specified for selecting sites for the SPR expansion, was within one year from the date of enactment—August 8, 2006. The scoping process was extended twice, first as a result of Hurricane Katrina and second when the State of Mississippi submitted a new site for consideration. This resulted in several weeks of

delay in the completion of the scoping process as well as the Draft EIS, now projected for issuance in mid April. Due to these delays, the Department hopes to complete the Final EIS by August 8, 2006, and issue the Record of Decision by September 8, 2006.

Question 7b. The Department's FY 2007 budget request for SPR calls for a 5.4% decrease (25% decrease if you include the Katrina drawdown). Will the Department be prevented from meeting its existing responsibilities as well as its new statutory mandates under these restraints?

Answer. The SPR budget request provides sufficient funding to perform its ongoing operations and maintenance activities, and maintain its readiness to conduct drawdown operations if required to do so. The FY 2007 request reflects a return to normal requirements following one-time expenses related to the Hurricane Katrina drawdown and construction of the oil degasification plant which occurred in prior years.

EPACT 2005 requires that the Secretary of Energy "shall, as expeditiously as practicable, without incurring excessive cost or appreciably affecting the price of petroleum products to consumers, acquire petroleum in quantities sufficient to fill" the SPR to the one billion barrel authorized capacity. The FY 2007 Request is sufficient to comply with responsibilities established under EPACT 2005.

Question 7c. Have all of the refiners complied with the terms and schedule for repaying the loans made from the SPR in the post-Katrina period? Can you comment specifically on when you expect all of the loans to be completely repaid?

Answer. We loaned 9.8 million barrels of oil to six companies in September and October 2005. A total of 10.3 million barrels, including premium barrels, is due in return.

Four companies completed returns of 3.4 million barrels to the SPR on schedule by the end of November 2005. The two remaining companies have partially repaid an additional 0.9 million barrels, for a total of 4.3 million barrels received to date.

Deliveries of the remaining 6.0 million barrels are underway, with original contract terms requiring completion by May 2006. However, uncertainty surrounding the availability of commercial terminal facilities may cause us to renegotiate the contracts to stretch out deliveries into the summer.

An additional loan of 870,000 barrels was made in January 2006 due to a marine channel blockage. Return of the oil, plus premium barrels, was completed in February 2006.

Question 7d. The deadline in section 301 of the Energy Policy Act for setting procedures to acquire petroleum for the SPR has passed. What is the Department's progress in developing these procedures?

Answer. Work on the draft proposed acquisition procedures was delayed due to the extraordinary demands placed on the SPR program as a result of Hurricanes Katrina and Rita and the attendant loans and sales of oil. Congress was informed of the delay to the draft proposed procedures in December 2005 and of the Department's intention to propose the procedures before April 6, 2006.

Because of the delay in proposing the procedures, we also informed Congress that we would not meet the requirement for promulgation by February 4, 2006. However, we plan to complete the process of publishing the draft procedures in the *Federal Register* for public comment and promulgating the procedures as soon as possible thereafter.

Question 7e. Please comment on what lessons the Department learned in the aftermath of Hurricanes Katrina and Rita with respect to the operation and utility of the SPR.

Answer. The location of the caverns approximately 2000 feet below the earth's surface provides a secure storage environment with little vulnerability to natural or man-made dangers. The surface facilities are designed with the susceptibility of the region to hurricanes in mind. All of the critical systems are designed to withstand 150 mile per hour winds. Although Hurricane Katrina dealt a glancing blow to our storage site near Baton Rouge, that site was prepared to deliver oil within 48 hours of the hurricane passing, and most of the 9.8 million barrels of loans were delivered from that location. More seriously, Hurricane Rita passed very close to our West Hackberry, Louisiana site near Lake Charles, Louisiana, completely devastating local towns and the homes of our employees. Nevertheless, damage to the site was minimal, and as soon as roads were reopened and electricity restored, that site delivered the preponderance of the 11 million barrels of oil sold in response to Hurricane Katrina.

The experience of Hurricanes Katrina and Rita reinforces that crude oil strategic storage in the Gulf is the most flexible, cost effective option to protect against an array of disruption scenarios.

While the effect of the hurricanes was devastating beyond any expectations, the Strategic Petroleum Reserve performed very well. In addition, a new appreciation of the importance of commercial power to restoring the whole petroleum industry infrastructure after disasters of this type, will cause systems to be hardened and backup systems to be in place to lessen the effect of any such future event.

ENERGY EFFICIENCY

Question 8. Title I of the Energy Policy Act included numerous provisions authorizing the Department to undertake initiatives and pilot programs to encourage the adoption of energy-efficient technology to reduce our energy consumption. The Department has moved aggressively to implement appliance efficiency standards.

What is the Department's plan to implement the rest of the energy-efficiency provisions included in the Energy Policy Act?

Answer. EERE has made great progress in delivering EPACT requirements. On October 18, DOE issued a final rule to codify 15 new appliance standards prescribed by EPACT 2005. On January 31, DOE submitted to Congress ahead of schedule an EPACT-required report detailing the reasons for past delays and the Department's plan for expeditiously prescribing new and amended standards. Currently, DOE is working on another "en masse" rulemaking to clarify and codify the test procedures specified by EPACT 2005. Many of the other energy-efficient provisions of EPACT are incorporated into existing programs where appropriate.

ENERGY SAVINGS PERFORMANCE CONTRACTING

Question 9a. We would like to get the ESPC program back on track. It was reauthorized in the energy bill so that the government could continue to use this very successful program. Our main concern is that some agencies might be overreacting to the comments the GAO made about this program. Overall, GAO praised the ESPC program and offered suggestions for improvement, as they would any worthy program. We support efforts to improve the program,' and the committee hopes that improvements can be made expeditiously. Program administrators need support and encouragement to liberally apply this program to capture all avoided energy and maintenance costs in their pursuit of best value for the Government.

What is the Department doing to make sure that government agencies are using this program by making it more user-friendly, flexible and expedient?

Answer. The Department is: providing expert Energy Savings Performance Contract Project Facilitators to federal agencies to ensure the process is user friendly and expedient and that the best deal for the government is obtained; standardizing templates and report requirements for each phase of the contract process, especially for measurement and verification; and educating agencies on their roles and responsibilities through workshops and web-based training opportunities.

Question 9b. What is the Department doing to do to ensure that the energy savings targets in the energy bill are actually met by federal agencies?

Answer. The Department is: issuing policy guidance to the agencies on the energy bill goals; supporting agencies in their efforts to achieve the goals by providing ESPCs, technical assistance, Energy Saving Expert Teams, and technology transfer; and assisting agencies in the development of strategic plans for energy management efforts and goals. To track performance, the DOE continues to collect agency energy data annually and report to the President and Congress on federal agency progress. The data forms the basis for federal scorecard assessment developed in conjunction with the Office of Management and Budget.

Within the Department of Energy, Deputy Secretary Clay Sell issued a "Performance Requirements for Energy Management" memorandum on February 7, 2006, to establish a new process for more streamlined and effective energy management practices. The Department also recently implemented several steps to conserve energy. These include lowering thermostat settings by three degrees in the winter and increasing them by three degrees in the summer, and reducing the duration of operation of our heating, ventilation and air conditioning equipment to cut its overall energy use.

Question 9c. What are your plans for engaging those agencies that are not currently using ESPC to improve their energy performance?

Answer. All the major agencies are participating in high-level quarterly ESPC Steering Committee meetings and are rehiring and/or reassigning staff dedicated to administering ESPC projects.

To assist the agencies, the Department of Energy will meet individually with all agencies to: discuss development of strategic energy-management plans that highlight ESPCs as one of many tools to help agencies meet energy savings targets; re-

quire Project Facilitators for every ESPC project; and accelerate education and outreach efforts to promote ESPC use.

Question 9d. What are your plans to measure and reward expanded use of this program and the associated accomplishments by all agencies including those currently using it?

Answer. To reward agency energy managers and teams for progress in reducing energy use the Department hosts an annual Federal Energy and Water Management awards event, and the Office of Management and Budget hosts a Presidential Awards program. Some agencies highlight their use of ESPCs to help achieve energy goals in their award nominations. However, it is important to note that ESPCs are a means to an end (energy savings), not an end in and of themselves.

CLEAN COAL POWER INITIATIVE

Question 10. In Title IV of EPAct 2005, Congress created a "Clean Coal Power Initiative" to stimulate the use of highly efficient clean coal technologies. But the Department's budget does not appear to contain any of the elements in that program. Can you please explain why this is not in the budget request?

Answer. The 2007 Budget provides $281 million for the Coal Research Initiative, nearly completing (total of $1.9 billion requested from 2002-2007) the President's $2 billion, ten-year commitment for clean coal R&D four years ahead of schedule. Within the Coal Research Initiative, the Department's intent is to continue to support of the Clean Coal Power Initiative (CCPI). The Budget reduces the addition of new funds to CCPI, so that the program can take steps to improve the use of funds already provided for projects. As identified in its Program Assessment Rating Tool (PART) review, CCPI and its predecessor demonstration programs have over $500 million in unobligated balances committed to selected projects, including money for projects that were selected several years ago and have not begun construction. The program is working to improve project selection to ensure consistency with the R&D Investment Criteria, withdraw funds when projects stall, and improve contract and project management controls to achieve the desired results. Ongoing CCPI projects, FutureGen, and various tax incentives including those authorized in the Energy Policy Act of 2005 continue to provide incentives for demonstration of clean coal technologies. The fiscal year 2007 request for CCPI of $5 million, along with funds from the prior appropriations will go towards the accumulation of funds for a future CCPI solicitation. In addition, if other clean coal projects do not go forward, then any additional prior year clean coal funding that becomes available will also be applied towards the funding for a future CCPI solicitation.

ENERGY EFFICIENT BUILDING CODES

Question 11. The Department's '07 Budget request substantially reduces funding for work on residential and commercial energy efficient building codes. In last year's budget request the Department placed emphasis on the substantial energy savings that might be realized through greater residential and commercial building efficiency codes.

Would you please explain why the Department has shifted away from an emphasis on building efficiency?

Answer. The Department continues to support a robust program of research and development, technology validation and market transformation in building technologies. The 2007 budget request is $77 million, about the same as 2006 enacted on a comparable basis. In the area of building codes training and technical assistance, the Department believes that the States have developed sufficient expertise and capability to upgrade, implement and enforce their building energy codes and has requested no funding in this area. States can choose to use funding from DOE's State Energy Program formula grants to support programs that increase building code compliance. The Department's FY 2007 budget request includes an increase of $13.8 million for the State Energy Program.

SCRUBBING TECHNOLOGY FOR HIGH SULFUR COAL

Question 12. Section 416 of Title IV of EPACT 2005 directs you to use $5 million from appropriated funds to initiate, through the Chicago Operations Office, a project to demonstrate the viability of high-energy electron scrubbing technology on commercial-scale electrical generation using high-sulfur coal.

Can you tell the committee when the Department intends to initiate this project?

Answer. With regards to the high-energy electron scrubbing technology project as identified in Section 416 of Title IV in EPACT 2005, the Department is committed to complying with EPACT. It is assessing the process necessary to legally implement this provision.

LOCOMOTIVE FUEL EFFICIENCY

Question 13. The Department's budget proposes $42 million for the "21st Century Truck Partnership," an initiative to increase the efficiency of freight trucks. However, the budget recommends nothing for locomotive fuel efficiency—even though railroads carry more intercity freight than any other mode, and even though the energy bill authorizes $65 million for a locomotive R&D program.

Why does the budget not request funding for the locomotive fuel efficiency program?

Answer. DOE's request is based on careful consideration of the research priorities based on the potential oil savings for each R&D activity. Priority has been given to R&D to improve highway transportation fuel efficiency because this sector uses 51 percent of the oil consumed in the United States (2003). In comparison, rail freight accounted for only 1.2 percent of all U.S. oil use or about 10 percent of the oil used by freight trucks. FY 2006 funding will mark the completion of a five-year, over $5.6 million ($11.3 million with industry cost share) effort with the domestic locomotive manufacturers, General Electric (GE) and Electro-Motive Diesel (EMD). This effort meets the EPACT 2005 Section 751 locomotive objectives. GE is already advertising improved efficiency locomotives for sale. Materials R&D has also completed a six-year, $700,000 effort to reduce rail friction that has seen the commercialization of one friction-reducing technology. While further research is not warranted because of the low potential for additional oil savings, it is expected that continuing R&D on advanced internal combustion engines for highway use (commercial trucks and passenger vehicles) will be applicable to locomotive engines.

YUCCA MOUNTAIN

Question 14a. The budget requests $544.5 million for the Yucca Mountain project this year. The supporting documents states the administration intends to submit to Congress a legislative proposal on the project.

When do you anticipate that the administration will submit this legislative proposal to the Congress?

Answer. This legislative proposal is currently under review within the Administration, and we hope to submit this proposal to the Congress soon.

Question 14b. The budget requests $544.5 million for the Yucca Mountain project this year. The supporting documents states the administration intends to submit to Congress a legislative proposal on the project.

How will this legislative proposal facilitate progress on the Yucca Mountain project?

Answer. While the details of this proposal are still under consideration, legislation is needed on a number of topics, including permanent land withdrawal of the site, which is required before construction authorization by the Nuclear Regulatory Commission, and funding reform, which will assure the project of receiving adequate funding from the Nuclear Waste Fund for its intended purpose.

Question 15a. Some critics of Yucca Mountain now claim that issues related to quality assurance programs undermine the scientific viability of the repository.

Do you remain convinced that the repository can meet current or proposed regulatory standards to assure the protection of public health and the environment?

Answer. Yes, Yucca Mountain is a robust site capable of meeting regulatory standards and requirements to protect the public, workers, and the environment. I am confident that a geologic repository designed and constructed by the Department and licensed by the Nuclear Regulatory Commission can meet the current or the proposed standards for radiological protection.

Question 15b. Some critics of Yucca Mountain now claim that issues related to quality assurance programs undermine the scientific viability of the repository.

Is progress on Yucca Mountain critical not just to meet federal obligations under contracts with nuclear utilities, but also to assure the long-term disposition of defense nuclear waste as sites such as Hanford, Savannah River and the Idaho National Laboratory?

Answer. Absolutely. Progress on Yucca Mountain is critical to providing a disposal solution to the defense nuclear waste at several sites around the nation, in addition to spent nuclear fuel from naval reactors, and research reactors. Commercial and defense spent nuclear fuel and high-level radioactive waste is currently being stored at 122 sites in 39 states.

CLEANUP AT LOS ALAMOS NATIONAL LABORATORY

Question 16. Mr. Secretary, two years ago, the Department of Energy, the NNSA and the State of New Mexico agreed to a comprehensive cleanup strategy at Los Al-

amos National Lab. At a minimum, the Department must provide $120 million to comply with the cleanup obligations in the Consent Order signed by the parties. This budget request only provides $90 million, which is not sufficiency to comply with the order.

What is the basis for the funding reduction from $140M provided in FY'06 and what impacts will this have on the consent order?

Answer.

FUNDING SUMMARY

[Dollars in Thousands]

Program/ Activity	FY 2005 Approp.	FY 2006 Request	FY 2006 Approp.	FY 2007 Request	FY 2007 Request vs. FY 2006 Approp.
Los Alamos National Laboratory	116,2529	142,209	140,792	90,602	−50,190

As you know, we have had significant performance issues for years with the previous contractor's environmental work at the Los Alamos National Laboratory (LANL). Additionally, LANL has not yet been able to provide an integrated cost and schedule baseline that the Department of Energy (DOE) is able to validate.

We believe that the new contract will address these performance issues, offer us new opportunities to continue significant cleanup and risk reduction, and deliver progress towards a new baseline. To that end, senior officials within the DOE have asked for the involvement of senior executives of the parent companies of the new contractor to deliver efficiencies and a baseline that can withstand scrutiny and can be validated by the DOE. We assure you that we remain committed to the Los Alamos Compliance Order on Consent (March 2005) with the State of New Mexico.

TREATMENT OF LANL RETIREE PENSION BENEFITS

Question 17a. On January 27th, Senator Bingaman and I sent the Department a letter urging that you oppose the proposal by the University of California Board of Regents to separate the retirement assets of the LANL Employees from the University of California Retirement Plan. It was our understanding and the understanding of the retirees that these benefits would remain unchanged as a result of the contract competition.

Yesterday, Administrator Brooks responded to the UC proposal asking for more information from Board of Regents and expressing his preference that the retirement benefits would remain within the plan.

When will the Department make a final decision on the Board's request?

Answer. The University of California (UC) has not submitted a proposal to the Department to separate the retirement assets of Los Alamos National Laboratory (LANL) employees and retirees from the University of California Retirement Plan (UCRP). If such a plan were submitted the Department would consider it, but we have communicated that it has been our expectation that the individuals who retire from LANL prior to the LANS transition, as well as those who elect to leave their interest in the UCRP, remain members of the UCRP. We cannot, however, indicate when a final decision would be made until a proposal has been received.

All assets in UCRP would be used for the benefit of the plan members under the present situation or under a spin off of the LANL population, were that to occur.

TREATMENT OF LANL RETIREE PENSION BENEFITS

Question 17b. On January 27th, Senator Bingaman and I sent the Department a letter urging you to oppose the proposal by the University of California Board of Regents to separate the retirement assets of the LANL employees from the University of California Retirement Plan. It was our understanding and the understanding of the retirees that these benefits would remain unchanged as a result of the contract competition.

Yesterday, Administrator Brooks responded to the UC proposal asking for more information from Board of Regents and expressing his preference that the retirement benefits would remain within the plan.

Are you aware of any financial benefit to the federal government that might be realized under the UC proposal? What about potential costs?

Answer. The University of California (UC) has not submitted a proposal to the Department to separate the retirement assets of Los Alamos National Laboratory (LANL) employees and retirees from the University of California Retirement Plan (UCRP).

FREELY ASSOCIATED STATES

Question 18a. Please provide the committee with a breakdown of the Department's Environment, Safety and Health FY07 request for the Marshall Islands Program including the health, environment, and logistical support elements of that request.

Answer. In FY2007, the Department is requesting $6.0M for the Marshall Islands Program. The request does not include a specific breakdown by activity because these costs vary from year-to-year. The Department reviewed past costs and estimates the total cost of the two atoll medical programs to be $2.5 million including $1.3 million for medical logistics. The Department estimates that the total cost of environmental monitoring activities to be $3.5 million including $1.75 million for logistical support.

Question 18b. What is the capability of and cost for the Department to do a survey of Runit Island at Enewetak Atoll in the Marshalls if undertaken at the same time as DOE's annual field survey work?

Answer. The DOE Marshall Islands program supports field science and radiological monitoring to assist decision-making on the resettlement of the displaced Atoll populations.

DOE does not have the authority or capability to conduct an engineering survey of the containment structure of the dome.

Question 18c. Can you reassure the committee that the department's experts from the ESH/RMI program will be available to work with experts from DOE, HHS, and the RMI government on developing options to enhance the effectiveness of healthcare in the RMI?

Answer. Yes. The Department of Energy (DOE) will continue to work as part of the interagency group comprised of the State Department, the Department of Health and Human Services, the Department of the Interior, as well as with Congress, and the government of the Republic of the Marshall Islands (RMI) to develop the most effective means of delivering medical assistance required under Public Laws 99-239 and 108-188, the Compact of Free Association between the U.S. and Republic of the Marshall Islands.

DOE's Deputy Assistant Secretary (DAS) for Health recently reaffirmed the Department's commitment to continuing interagency dialogue to address health care options for the RMI by meeting with officials from the State Department and the Department of Health and Human Services. In addition, the DAS is meeting with the senior Marshallese officials on this topic in April 2006.

RESPONSES TO QUESTIONS FROM SENATOR LANDRIEU

OIL AND NATURAL GAS RESEARCH TERMINATION

Question 1. Mr. Secretary, according to DOE, 85% of the historic oil and natural gas technologies programs' focus has been directed toward exploration and production activities undertaken by the independent producer. Independents drill 90% of the nation's oil wells and produce 85% of its natural gas and 60% of U.S. oil. Typically, these companies do not have access to in-house, costly R&D that the larger, integrated multi-national companies do. Similarly, much of the historic focus of the DOE R&D program has been to extend the productivity of existing domestic reservoirs and to improve the technologies for developing non-conventional reservoirs. Given that independent producers are the primary developers of these resources, how does terminating federal R&D square with the President's agenda of reducing dependence of foreign sources of oil?

Answer. Oil and gas are mature industries and both have every incentive, particularly at today's prices, to enhance production and continue research and development of technologies on their own. There is not a need for taxpayers to subsidize oil companies in these efforts. The Administration's Research and Development Investment Criteria direct programs to avoid duplicating research in areas that are receiving funding from the private sector, especially for evolutionary advances and incremental improvements.

Research and development (R&D) in the oil and gas industry is led by the service companies, not the majors or the independent producers. Independent producers, as well as the majors, purchase innovative technologies developed by service companies. Oil and Gas Financial Journal, a respected trade publication, reports: "Major

service companies . . . are spending between three percent and four percent of their revenues on R&D. This is triple or quadruple the rate of the oil majors, which spend only 0.5 percent of upstream revenue." Private control of intellectual property provides a market incentive for the private sector to invest in R&D and advance technology.

While not part of the Fossil Energy budget, The 2007 Budget's proposals to expand access to oil and gas resources, streamline permitting processes, and make the R&D investment tax credit permanent leverage private sector ingenuity and are better ways to increase domestic production of oil and gas than federally funded R&D. The President's goal of reducing dependence on foreign sources of oil will also be addressed by the Advanced Energy Initiative proposed in the budget including advancements in cellulosic ethanol, battery technology, and hydrogen, among others.

Question 2. Mr. Secretary, the Energy Policy Act of 2005 authorized the expansion of the Strategic Petroleum Reserve from 750 million to 1 billion barrels of oil. It also directed that the Department develop, within one year, a site acquisition plan to accomplish the expansion. Could you please update the Committee on the status of the Department's progress in carrying out this provision of the act? Does the budget request include the funding necessary to complete development of the site selection plan and to begin site acquisition?

Answer. The Energy Policy Act of 2005 requires DOE to complete a process to select sites necessary for the expansion of the SPR to one billion barrels by this August. The SPR expansion is a major Federal action, requiring the preparation of an Environmental Impact Statement under the National Environmental Policy Act (NEPA), before making a decision on site selection.

The Department issued a Notice of Intent to prepare an Environmental Impact Statement for the selection of sites for the expansion of the SPR on September 1, 2005. The SPR Office has identified the candidate sites and completed public scoping meetings in Lake Jackson, TX, Houma, LA, Jackson, MS and Port Gibson, MS. The Department is also engaged in the preparation of conceptual designs and geotechnical analyses of the candidate sites. All this is required prior to site selection.

The SPR appropriation for FY 2006 does provide sufficient funding to complete the NEPA environmental review and site selection process. The process for selecting sites for the SPR will be completed in August or September 2006. The 2007 President's Budget doesn't request any funds for site acquisition.

Question 3. DOE's Office of Science is complying with direction provided by the Appropriations Committee to establish a National Institute for Climatic Change Research (NICCR) center that will focus on understanding "the impacts of global and regional climatic changes on riparian and coastal environmental and ecological systems." I encourage this effort.

How will you, the Department, and the Office of Science work in the future to better understand climatic changes in the coastal regions of the U.S., including the wetlands?

Answer. The DOE Office of Science published a Notice (DE-FG02-06ER06-08) on January 13, 2006, requesting applications from U.S. universities to establish a cooperative agreement with the Office of Science to host the new Center for Riparian and Coastal Ecosystems, as part of the NICCR. Based on a merit review of the applications received by the due date (April 18, 2006), the Office of Science will later this year establish a cooperative agreement to host the new NICCR center. The Office of Science will then work with the host university to develop and publish requests for proposals (RFPs) on an approximately annual basis. The requests will be for research related to impacts of global and regional climatic variability and change on U.S. coastal and wetland ecosystems and the zone or area adjacent to natural waterways, including streams, rivers, lakes, and tidal zones. Impacts of sea level rise and coastal subsidence on coastal ecosystems will be included. The RFPs will solicit proposals for laboratory experiments, field studies, and ecological modeling. The proposals received by the center will be subjected to scientific merit review on an open, competitive basis.

Responses to Questions From Senator Menendez

TRANSURANIC PRODUCTS

Question 1. Secretary Bodman agreed at the hearing that the transuranic products generated by the new reprocessing technologies cannot be used to make a nuclear weapons. Can you provide the committee with evidence to support that statement?

Answer. In responding to Chairman Domenici, I should have clarified that the mixture of transuranic materials produced from the UREX+ process provides greater proliferation resistance than the separated plutonium produced by existing reprocessing facilities. The advantage of GNEP over the current nuclear fuel cycle is that it avoids the accumulation of separated plutonium and weapons usable materials. If requested, I will be pleased to provide the Committee with more detailed briefings on the UREX+ plus technology.

Question 2. The Department of Energy claims that the reprocessing technologies it will pursue will not be as proliferation-prone as conventional reprocessing because the plutonium would be mixed with other transuranic elements, such as neptunium, americium, and curium, with the insinuation that these elements are too radioactive to make reprocessing by a terrorist group feasible.

However, recent statements by a scientist in DOE's Advanced Fuel Cycle Initiative program seem to indicate these other transuranics are not excessively radioactive. He claimed a dose rate of less than 1 rad per hour at one meter—100 times less than the accepted standard for self-protection of 100 rails per hour at one meter, and a thousand times lower than the dose rate from spent fuel fifty years after reactor discharge. Can you assess the accuracy of this statement? If it is accurate, is it possible that the mixture containing plutonium and additional isotopes could be stolen and processed without the need for shielding and contact-handling?

[Source: E.D. Collins, Oak Ridge National Laboratory, "Closing the Fuel Cycle Can Extend the Lifetime of the High-Level-Waste Repository," American Nuclear Society 2005 Winter Meeting, November 17, 2005, Washington, D.C., p. 13]

Answer. No claim has been made that a mixture, of transuranic (TRU) elements (neptunium, plutonium, americium and curium) would provide inherent protection in the form of penetrating radiation sufficient to prevent terrorist access. However, keeping neptunium, americium, and curium with the plutonium does increase the level of penetrating radiation compared to pure plutonium, making the material more proliferation resistant than pure plutonium. The exact dose rate depends on the exact composition of used fuel, with some options considerably more than 1 rad per hour at one meter. All of these TRU composition options would require hot cells and remote manipulation, as contrasted with glove boxes used for plutonium-MOX fuel manufacture in several countries today.

The GNEP proposal contains other features also intended to increase proliferation resistance. First, commercial preparation of recycle fuel would very likely involve an integrated operation by which chemical separations would be followed by fuel fabrication at the same site, so that separated TRU would not have to be transported. Second, the TRU mixture is much less attractive for explosive weapons use than pure plutonium. Curium through spontaneous fission provides a strong neutron field which would require very sophisticated handling and complex weapon design. Americium and curium increase the heat spontaneously generated, making handling and weapon fabrication more difficult. Third, a modem commercial UREX+/fuel fabrication would be equipped with state-of-the-art monitoring and accountability systems specifically designed to prevent unauthorized access and misappropriation. Using much less sophisticated instrumentation and control, the world's existing PUREX plants have operated for decades without any record of unlawful diversion.

The significant proliferation hazard in the future is the spread of uranium enrichment technology, the uncontrolled multiplication of PUREX separation plants, and the continuing accumulation of weapons-usable material in used fuel. GNEP is designed to deter each of these hazards.

Responses to Questions From Senator Murkowski

Question 1. I notice the DOE budget calls for an increase of $5 million to $44 million for wind energy development. Will the Department revive a technology development grant program with some of that money? While not all members of this committee love wind energy I have reviewed new technologies that promise to further cut costs and make wind cost effective without the production tax credit subsidy, if only there was a source of grant funding to pay for development of larger, working demonstration units. Will you consider resurrection of the technology grant program this year?

Answer. Through its Low Wind Speed Technology activity, the Department has funded an ongoing series of public/private partnerships to support the development of large wind turbine technologies that will lower the cost of wind energy, including the development and testing of prototype turbines. We expect to offer support for competitively awarded, cost-shared partnerships for onshore large wind turbine technology development in 2007.

Question 2. Parochially, I would love to see the Department not zero out all funding for the Office of Arctic Energy Research, currently based in Fairbanks. I'm not proposing that you keep an Alaska office open forever, but in the past five years the office has done great work, but clearly not yet scratched the surface on devising innovative renewable energy project to provide lower cost power to Alaska's 227 rural villages, where diesel-generated power this winter is costing up to 71 cents per kilowatt hour to produce (Lime Village). Would you work with me to see if some level of funding for innovative projects focusing on village needs can continue somewhere in the Department's budget?

Answer. The Office of Arctic Energy Research has received Congressionally directed funding through the Office of Fossil Energy's Office of Oil and Natural Gas. The FY 2007 Budget proposes to terminate that program because at today's oil prices, there is every incentive for industry to both produce oil and gas and conduct research to enhance production. There is not a need for taxpayers to subsidize oil companies in these efforts.

The Wind Program within the Office of Energy Efficiency and Renewable Energy through the National Renewable Energy Laboratory, has been working with the Alaska Energy Authority, and Alaskan rural energy cooperatives for over ten years exploring wind-diesel hybrid systems specifically tailored for Alaskan applications. In addition, our efforts to lower the cost of alternative energy resources in general should prove beneficial to Alaska's ratepayers. We would be happy to discuss these with you and your staff.

Question 3. While the energy bill called for the Department to carry out demonstration projects for injection of carbon dioxide into aging oil fields, specifically in the Willston Basin in the west and in Cook Inlet in Alaska, with the zeroing out of the Oil Research office in the Office of Fossil Fuel, I get the impression that CO_2 research, outside of the narrow area of carbon sequestration from coal production, is on the back burner. What are your intentions toward funding a wider range of CO_2 sequestration projects as part of your $281 million coal research initiative?

Answer. The Sequestration Program has and will continue to pursue initiatives in the research of CO_2 sequestration in various geologic reservoirs such as depleted oil and gas fields, producing oil fields to enhance recovery, saline formations, coals seams with enhanced coal-bed methane production, and other promising formations. Within the Regional Partnership Program, there are twenty-five (25) various sequestration injection tests being planned. These tests include depleted oil and gas fields, saline reservoirs, stacked saline and enhanced oil recovery reservoir tests, and coal seams with enhanced coal-bed methane production. In addition to the Regional Partnership Program, research and testing are continuing in other sequestration field tests including an injection test in a saline formation in Frio, Texas, and enhanced oil recovery projects at the Weyburn and Apache oilfields in Saskatchewan, Canada that utilize CO_2 produced at the Great Plains Coal Gasification Plant.

The results from these field tests will provide improved understanding of the factors affecting permanence and capacity in a broad range of CO_2 storage reservoirs. Along with the storage of CO_2 at these field tests, research in the monitoring, mitigation, and verification of the CO_2 will be conducted to monitor and verify the amount of CO_2 stored and in the unlikely event, mitigate any leakage that should occur. In conclusion, the Sequestration Program does attempt to investigate the various geologic formations such as depleted oil and gas fields, producing oil fields to enhance recovery, saline formations, and coals seams for the storage of CO_2.

Responses to Questions From Senator Salazar

renewable energy & energy efficiency

Question 1. Just two days ago, DOE's National Renewable Energy Laboratory (NREL) in Golden, Colorado, announced 32 layoffs due to cuts in the FY06 budget—including researchers in solar energy and biomass—at a time when the President announced his support for greater investment in biomass and solar research, among other things that the research conducted at NREL supports. Given the importance of the work at NREL, in terms of meeting the goals outlined by the President during his State of the Union Speech, what will you do to help me protect NREL's budget in the future? What changes will you make in your FY08 budget request to help insulate the lab's funding from appropriations earmarks?

Answer. On February 19, 2006, EERE reallocated $5M of funds to enable NREL to rehire all 32 laid-off individuals. NREL has extended rehire offers to all impacted individuals for their immediate return to work. Laid-off workers who are rehired will repay all severance monies.

The Conference Report accompanying the FY 2006 Energy and Water Appropriations bill gave DOE the flexibility to move funding between the sub-accounts within the Energy Supply and Conservation Appropriation to fund congressionally directed projects if the total amount of those projects exceeded 20% of the sub-account. The Department has not exercised this authority as of yet, but certainly will consider doing so in the future to avert problems like we experienced in the EERE program.

Question 2. What steps has DOE taken to transfer these employees to other DOE labs or to absorb them in other DOE programs?

Answer. On February 19, 2006, EERE reallocated $5M of funds to enable NREL to rehire all 32 laid-off individuals. NREL has extended rehire offers to all impacted individuals for their immediate return to work. Laid-off workers who are rehired will repay all severance monies.

Question 3. Given the emphasis on renewable fuels and new energy technologies in the President's State of the Union address, why didn't the President double or triple the National Renewable Energy Laboratory's budget?

Answer. In his State of the Union address, the President announced new solar and biofuels initiatives designed to accelerate the contribution of these transformational technologies to the Nation's energy portfolio. The President has requested commensurate funding increases for the Department's Solar Technology and Biomass programs, through which these initiatives will be managed, as well as funding increases in its Wind and Hydrogen, Fuel Cells & Infrastructure Technologies research and development programs. Together, the Solar, Biomass, Wind, and Hydrogen programs form the core of NREL's research and development capabilities, collectively accounting for 60% of all NREL funding. Depending on appropriations, NREL will likely receive increased funding in FY 2007 to support these initiatives. (The Department's Preliminary Lab Tables released with the FY 2007 Budget are estimates and may need revision.)

It is important to note each DOE program allocates funding to various national labs or to competitive solicitations for industry or university researchers in ways to best accomplish program goals. Increased funding for a program does not necessarily translate to increased funding for each national lab currently receiving funding from that program.

Question 4. Families and farmers and ranchers in my state face tough choices this winter with both high gasoline prices and the highest natural gas prices in recent memory. Your Energy Information Administration reports that reducing natural gas demand by only 2 to 4 percent through more efficiency and renewables could reduce wholesale natural gas prices by 25 percent. Yet the FY07 budget actually reduces funding for energy efficiency by 18 percent. Overall, the budget for energy efficiency and renewable energy R&D appears to be about level with last year. Could you direct us to portions of the budget that might help alleviate these high energy costs in my state?

Answer. As you noted, the Department's total funding request for energy efficiency and renewable energy R&D in FY 2007 is approximately equal to FY 2006 appropriations. In its FY 2007 request, however, the Department has substantially increased research and development funding for technologies that promise wholesale transformation of how the Nation obtains and uses energy. These technologies include solar, biofuels and hydrogen fuel production, storage, and fuel cells. In his recent State of the Union address, the President announced new initiatives in biofuels and solar power. These research and development investments will substantially increase the Nation's and Colorado's energy choices and long-term energy security.

Question 5. Numerous important provisions of Energy Policy Act 2005 (e.g., promoting energy efficiency and conservation, renewable energy, clean coal technologies, other new energy technologies) are not reflected in the budget. See the chart prepared by Senator Bingaman's staff. Why not? Do we have to wait until the President's FY08 budget request to see the administration's support for funding for these programs?

Answer. The Energy Policy Act contains authorizations for a variety of initiatives. As the Administration noted in the July 15, 2005, letter to the conference committee on H.R. 6, the House and Senate versions include authorizations levels that set unrealistic targets and expectations for future program-funding decisions. The President's Fiscal Year 2007 Budget proposal reflects the Administration's programmatic and fiscal priorities. Those priorities took into account the spending opportunities presented by the Energy Policy Act.

Question 6. Can you offer to the committee the rationale for zeroing out funding for research and development on geothermal and hydropower—both energy sources that have the potential of supplying large quantities of clean base-load power?

Answer. The Geothermal Program has achieved its key technical objectives. Geothermal is now a mature energy technology. New geothermal projects in the United

States are planned for California, Nevada, Idaho, Alaska, Hawaii, Utah, and Arizona. There are 483 megawatts of new power purchase agreements signed in California, Nevada, Idaho and Arizona. Projects under construction, or which have both Power Purchase Agreements and are undergoing production drilling, amount to 547 megawatts in the seven western states. The Western Governors Association geothermal task force recently identified over 100 sites with an estimated 13,000 MW of power with near-term development potential.

The highest priority of the geothermal industry has been the attainment of the production tax credit, which the passage of the Energy Policy Act of 2005 provided. In addition, the Energy Policy Act streamlined geothermal leasing and changed the royalty structure to provide incentives for local governments to promote geothermal development. The Energy Policy Act also mandated that the U.S. Geological Survey update maps providing detailed geothermal resource data. Together, these statutory changes will spur geothermal development without the Department's Geothermal Program.

Similarly, we believe that industry now has the ability to achieve hydropower efficiency optimization and fish survivability performance targets without further Federal investment. In the fiscal year 2006 Appropriations Conference Report, the conferees recommended $500,000 for hydropower research, directing the Department to "complete integration studies and close out outstanding contracts in advanced hydropower technology."

Question 7. A bipartisan group of Senators and Congressman have teamed up on legislation called the Vehicle and Fuel Choices for American Security Act (S. 2025 in the Senate, H.R. 4409) that provides an action plan to save *1 million barrels of oil per day by 2014, 2.5 million barrels per day in 2017 and 10 million barrels per day by 2026.* Given the President's stated commitment to reduce America's dependence on foreign sources of oil, will the Administration now support this or other efforts in Congress to achieve oil savings?

Answer. The President's Advanced Energy Initiative proposes significant new investments and polices in three areas that will improve future energy security and reduce future demand for oil by increasing our use of ethanol, improving hybrid vehicles, and developing hydrogen technology. The 2007 President's Budget includes: $31 million in new research funding to support advanced battery research, a 27% increase over 2006 levels; $150 million for biomass fuels research, a 65% increase; and $289.5 million for hydrogen vehicle research.

Additionally, on April 25th the President called on Congress to make all hybrid and clean diesel vehicles sold this year eligible for federal tax credits and repeated his call for congress to send him a bill this year authorizing Arctic National Wildlife Refuge (ANWR) exploration.

OIL RENEWABLE/ALTERNATIVE FUELS

Question 8. What specific aspects of the President's budget request will help achieve the President's stated goal of reducing our dependence on foreign oil? Mideast oil? Our addiction to oil?

Answer. The Administration is making every effort to address America's short term energy needs while ensuring that we are able to meet future energy demands. Reducing America's dependency on imported oil has been and will continue to be a priority for this Administration. Since 2001, the Administration has spent nearly $10 billion to develop cleaner, cheaper and more reliable energy sources.

The Advanced Energy Initiative (AEI) will accelerate investment into clean energy technologies in order to transform the way we produce and use energy in our homes, business and our transportation sector. To achieve these goals, the President has requested $2.1 billion in FY 2007—a 22 percent budget increase—to develop new technologies and alternative sources of energy to help diversify and strengthen our nation's energy mix. The AEI is focusing on technologies that we believe hold the greatest promise for American taxpayers, including solar, biofuels, hydrogen, nuclear, and clean coal technology.

As part of President Bush's Advanced Energy Initiative, the FY 2007 budget request for the Hydrogen Fuel Initiative increased by $53 million over FY 2006 to $289.5 million to accelerate the development of hydrogen fuel cells and affordable hydrogen production, storage, and infrastructure technologies. Through public-private partnerships, the Hydrogen Fuel Initiative and related FreedomCAR programs aim to make it practical and cost-effective for Americans to begin to use clean, hydrogen fuel cell vehicles by 2020, and to have the infrastructure available to support them.

Question 9. What is the status of the biorefineries loan guarantee program authorized by the Energy Policy Act of 2005? Are there sufficient funds in the DOE budget

to implement this loan guarantee program? Did DOE request any funding for deployment of biofuels?

Answer. The Department is assessing procedures needed to comply with the provisions of the Federal Credit Reform Act and OMB Circular A-129 to implement the loan guarantee provisions of Title XVII of EPACT. The Department's Chief Financial Officer is heading up our efforts. The Department has not developed a specific time frame for completing these activities. The FY 2007 Budget provides no funds to implement loan guarantee provisions.

CLEAN COAL TECHNOLOGIES

Question 10. Background: Coal is the most abundant domestic energy source. It provides more than 50% of our nation's electricity needs, and America has enough coal to last more than 200 years. In Colorado, 71% of the electricity we consume is generated with coal. Colorado consumed 18.9 million tons of coal in 2004, generating 37.5 million megawatts of electricity. Most of this coal is from Colorado, but some is from Wyoming.

In the State of the Union Address, the President announced the "Advanced Energy Initiative," which he said would provide a 22% increase in clean energy research at the Department of Energy. The President indicted that, as part of this initiative, his budget would call for more investment in zero-emission coal-fired power plants. However, a careful review of the President's budget for the coal research initiative, which includes the base coal research program, the Clean Coal Power Initiative (CCPI) and FutureGen, indicates *that there is a decrease of $89 million in new funding* from last year's enacted budget levels. How do you explain the funding decrease for these activities when the President has made the development of clean coal power technologies a top priority?

Answer. The 2007 Budget for coal-fueled power generation focuses primarily on technologies for near-zero atmospheric emissions plants, which will be brought together in FutureGen, a full-scale, fully operational prototype plant cost-shared with private sector and international partners. The Budget requests $322 million for development of these technologies through FutureGen and supporting research and development in integrated gasification combined cycle (IGCC), hydrogen turbines, carbon sequestration, hydrogen separation, fuel cells, and cross-cutting advanced research. This is an increase of $21 million over the 2006 enacted budget level of $301 million for near-zero atmospheric emissions technology.

Funding for FutureGen and its supporting R&D is consistent with the Administration's R&D Investment Criteria and a priority because these technologies are a significant leap beyond the technology of conventional "pulverized coal" power plants and even IGCC without sequestration, and because they focus on long-term, potentially large public benefits. As a result, there are insufficient market incentives to expeditiously drive this innovation through the private sector alone. The Department's coal program also includes the Clean Coal Power Initiative (CCPI), which currently supports high efficiency and low criteria pollutant emissions goals. Although the last CCPI solicitation explicitly identified near-zero emission clean coal technologies, e.g., advanced IGCC and advanced coal plants with carbon sequestration, as being eligible for bid, none were selected, however we expect to request such technologies in a future CCPI solicitation.

Question 11. Just last year, this Committee successfully worked in a bipartisan fashion to pass an energy bill that authorizes $1.8 billion over nine years for the President's Clean Coal Power Initiative. Continued support and funding for the CCPI is needed to continue the development of new clean coal technologies and to ensure the continued viability of coal as a fuel source. I was therefore disappointed to see that the President requested only $5 million for this program in FY 2007—a 90% cut from the amount appropriated by Congress for FY06 and a tiny fraction of the $200 million authorized in the Energy Policy Act of 2005. What is the reason for this dramatic cut?

Answer. The 2007 Budget provides $281 million for the Coal Research Initiative, nearly completing (total of $1.9 billion requested from 2002-2007) the President's $2 billion, ten-year commitment for clean coal R&D four years ahead of schedule. Within the Coal Research Initiative, the Department's intent is to continue to support of the Clean Coal Power Initiative (CCPI). The Budget reduces the addition of new funds to CCPI, so that the program can take steps to improve the use of funds already provided for projects. As identified in its Program Assessment Rating Tool (PART) review, CCPI and its predecessor demonstration programs have over $500 million in unobligated balances committed to selected projects, including money for projects that were selected several years ago and have not begun construction. The program is working to improve project selection to ensure consistency with the R&D

Investment Criteria, withdraw funds when projects stall, and improve contract and project management controls to achieve the desired results. Ongoing CCPI projects, FutureGen, and various tax incentives including those authorized in the Energy Policy Act of 2005 continue to provide incentives for demonstration of clean coal technologies. The fiscal year 2007 request for CCPI of $5 million, along with funds from the prior appropriations will go towards the accumulation of funds for a future CCPI solicitation. In addition, if other clean coal projects do not go forward, then any additional prior year clean coal funding that becomes available will also be applied towards the funding for a future CCPI solicitation.

Question 12. The CCPI program is essential to insure that the cutting edge technologies that are developed in the research program, many of which may be capable of novel carbon capture techniques for both new generation sources as well as for the existing fleet of coal-fired power plants, are demonstrated so that these technologies will be borne into the commercial market. It is our understanding that for the CCPI projects recently awarded in Round 2, the total private industry share was $1.5 billion, while the Federal Government share was $297 million. When and under what circumstances will the DOE seek another CCPI solicitation, or does this meager request of $5 million suggest that the CCPI program will be completely killed next year?

Answer. The Department's intent is to continue its program in support of the Clean Coal Power Initiative (CCPI). The fiscal year 2007 request for CCPI of $5 million along with funds from prior appropriations will go towards the accumulation of funds for a future CCPI solicitation. In addition, if other clean coal projects do not go forward, then any additional prior year clean coal funding that becomes available will also be applied towards the funding for a future CCPI solicitation.

The Budget reduces the addition of new funds to CCPI, so that the program can take steps to improve the use of funds already provided for projects. As identified in its Program Assessment Rating Tool (PART) review, CCPI and its predecessor demonstration programs have over $500 million in unobligated balances committed to selected projects, including money for projects that were selected several years ago and have not begun construction. The program is working to improve project selection to ensure consistency with the R&D Investment Criteria, withdraw funds when projects stall, and improve contract and project management controls to achieve the desired results. Ongoing CCPI projects, FutureGen, and various tax incentives including those authorized in the Energy Policy Act of 2005 continue to provide incentives for demonstration of clean coal technologies.

Question 13. Do the funding levels in the Department's FY07 budget request mean that DOE has picked one path forward—FutureGen—to use coal in the future? What about advanced combustion? What about developing alternative methods to capture CO_2 from the fleet of existing coal combustion plants?

Answer. The Department's budget request proposes a balanced R&D program portfolio, which currently emphasizes gasification based systems (such as FutureGen) because they show the greatest promise, are the farthest along in development, and are a transformational technology change consistent with the Administration's Research and Development Investment Criteria. The portfolio also includes (1) development of advanced combustion technology (such as oxycombustion and materials research for ultrasupercritical pulverized coal combustion plants), (2) development of CO_2 emission capture technology for both new and existing combustion based plants, (3) development of emission control systems for existing combustion plants, (4) development of very innovative concepts such as "chemical looping" that are applicable to combustion systems, (5) development of technologies that are applicable to both combustion and gasification based systems such as oxygen membrane technology that will dramatically reduce the cost of the oxygen needed for oxycombustion and gasification, (6) development of CO_2 storage technology (which is independent of the CO_2 source, combustion or gasification), and (7) the CCPI demonstration program under which both gasification and combustion technologies can be proposed.

Question 14. The Energy Policy Act of 2005 authorized loan guarantees for an Integrated Gasification Combined Cycle (IGCC) demonstration project in the western U.S. What is the status of the availability of these loan guarantees?

Answer. Title XVII of the Energy Policy Act of 2005 authorizes DOE to provide loan guarantees for renewable energy systems, advanced nuclear facilities, coal gasification, carbon sequestration, refineries, energy efficiency, and many other types of projects that use improved technologies in commercial projects that enhance energy economy and reduce emissions of pollution and greenhouse gases. The Department is assessing procedures needed to comply fully with the provisions of the Federal Credit Reform Act and OMB Circular A-129. The Department's Chief Financial Officer is heading up our efforts in consultation with the energy and science pro-

gram offices, the Office of General Counsel, the Office of Policy and International Affairs and others. The Department has not developed a specific timetable for completing these activities.

WEATHERIZATION GRANTS

Question 15. As you know, the budget for weatherization for low income housing has been cut dramatically from the previous year's request. Assuming that Congress agrees with this reduced budget, won't this reduction merely increase the requests for energy assistance under the Low Income Heating and Energy Assistance Program?

Answer. No. Most Weatherization Assistance Program clients would have already applied for and received LIHEAP energy bill assistance prior to requesting and receiving WAP assistance.

Question 16. I have seen figures that suggest that this cut will result in 33,000 low-income, elderly and working poor families next year being unable to weatherize their homes and save money for themselves and energy for the country. Does the DOE have any such analysis? Can you provide that analysis?

Answer. From 2002 through 2006, the Administration requested a cumulative total of $1.359 billion for the Weatherization Program, nearly doubling the baseline funding assumptions (using 2001 appropriations). Unfortunately, Congressional appropriations from 2002 through 2006 fell short of the Administration's requests by a cumulative total of $208 million. Nevertheless, increased appropriations driven by the President's 2002 through 2006 Budgets led to energy and cost savings for hundreds of thousands of the neediest low-income families.

The Administration made very difficult choices in developing the FY 2007 Budget. Reducing America's growing dependence on foreign oil and changing how we power our homes and businesses are among the Department's highest priorities, as outlined in the President's Advanced Energy Initiative.

The Department's benefits models indicate that the Weatherization Program does not provide significant energy benefits compared to the potential benefits of other programs where we are proposing to increase our investments. The table below sets out Weatherization Program funding for fiscal years 2005 through 2007, as well as the estimated number of units weatherized in each of those years.

[Dollars in Thousands]

	FY 2005	FY 2006	FY 2007 Request
WAP Grants	$228,160	$242,550	$164,198
Units	92,500	97,300	64,084

RESPONSES TO QUESTIONS FROM SENATOR SMITH

BPA DEBT PREPAYMENT PROPOSAL

Question 1. In recognition of this new proposal to use secondary revenues in excess of $500 million to prepay BPA's Treasury debt, does the Administration intend to withdraw its legislative proposal to count third-party financing arrangements against BPA's statutory debt ceiling?

Answer. No. The intent of the proposal to have certain non-debt transactions count against BPA's statutory borrowing limit is to create better financial transparency and management accountability. The Administration believes proper budget reporting of Federal debt and debt-like transactions is essential to improving the financial transparency and performance of the Federal government. The proposed legislation would count certain new financing transactions entered into after the date the legislation is enacted toward BPA's Treasury borrowing limit and would also provide for a $200 million increase to that limit.

Question 2. What price forecast levels for natural gas were used to determine BPA's secondary revenues under this proposal?

Answer. For the estimates of BPA's net secondary revenues developed for the 2007 Budget, the Administration relied on electricity broker quotes which are an indication of forward electricity prices at a specific point in time. Since broker quotes are one measure of the price for electricity, and the price of electricity in the western United States is generally correlated to the price of natural gas, one could infer that the forward price for natural gas was reflected in the electricity prices from the broker quotes. At the time the Administration's estimates were developed, in early January 2006, the calendar year 2007 NYMEX Henry HUB futures contracts

were trading around $9.75/MMBtu and the calendar year 2008 contracts were trading around $9.20/MMBtu.

Question 3. What would be the impact of the pre-payment proposal on BPA's year-end carry-over reserves?

Answer. Consistent with the President's budget, the increased advance amortization payments to Treasury on BPA's bond obligations dependent on an equivalent amount of assumed net secondary revenues are $168 million in FY 2007, $88 million in FY 2008, $83 million in FY 2009, and $80 million in FYs 2010-2011. Estimated advance amortization payments to Treasury vary from associated net secondary revenues and debt optimization amounts due to timing of Treasury payments and other factors. All else being equal, BPA year-end reserves would be lower by these additional transfers to the U.S. Treasury. Actual transfers could differ significantly from these figures due to many variables affecting BPA's net secondary revenues including the volatility of secondary power markets and the variability of annual streamflows.

Question 4. What assumptions were made about spill and flow augmentation in the coming years in determining BPA's secondary revenues?

Answer. For the estimates developed for the 2007 Budget, the Administration used the hydroelectric assumptions in BPA's Initial Wholesale Power Rate Proposal. In the Initial Rate Proposal, BPA assumed the operation of the system required by the 2004 Biological Opinion which includes spring and summer spill but does not reflect the additional spill associated with the 2005 or 2006 court orders or any additional flow augmentation beyond that in the 2004 Biological Opinion.

Question 5. What is to prevent future Administrations from earmarking other portions of BPA's revenues, or from lowering the $500 million threshold? What impact will this have on BPA's ability to self finance its operations?

Answer. While not providing certainty about possible future Administration proposals, the FY 2007 budget recognizes annual net secondary revenue over $500 million as extraordinary and provides that the net secondary revenue proposal be consistent with the sound business practices required under the Federal Columbia River Transmission System Act of 1974 and that any advance amortization payments be made consistent with statutory priority of payment requirements.

The Administration's proposal is directed at, and should only be viewed as precedent for, dealing with this situation of extraordinary net secondary revenues. As such, the Administration believes that the current proposal is consistent with affording requirements customers' power at cost-based rates.

The Administration believes the net secondary revenue proposal will help to provide BPA with needed financial flexibility to meet its future energy investment needs, including new transmission capacity, and that long-term power and transmission service customers of BPA should benefit from the advance amortization payments through lower long-term rates than would otherwise be the case. This proposal will be more fully assessed in an expedited rate case to implement the policy of advance payments on Treasury bonds with net secondary revenues that exceed $500 million annually.

Question 6. Given the U.S. corporations are competing in a global economy, and given the U.S. electricity and natural gas costs are much higher than in many other industrialized and emerging economies, shouldn't the Administration be seeking to lower energy prices in every region of the country?

Answer. The Administration and the Congress have taken several important steps to increase U.S. energy supplies and use energy more efficiently. We would not agree, however, that comparing the price of electricity and natural gas in the U.S. to the prices in other countries provides a useful guide to what our energy policies should be. For example, Norway has benefited from inexpensive electricity from hydropower (the situation, however is changing as Norway must now rely on its abundant natural gas supplies to generate electricity). This abundance of hydropower has resulted in electricity prices that have been much lower in Norway than in other countries. It would be a mistake for a country that is not endowed with hydropower or other cheap sources of electricity to seek an energy policy to have electricity prices to be as low as Norway's. Such a policy would lead to misallocation of resources and waste.

Very often, less developed countries have made such a mistake by subsidizing electricity. This causes many problems. It is hard to attract private investment in the country's electricity sector because it is impossible to make a profit when you have to sell electricity for less than it costs to produce. It also leads to wasteful use of electricity since the government subsidized-price undervalues the true cost of electricity and sends the wrong market signal.

We should expect substantial variations among countries' electricity and natural gas costs. Some of these variations result from the abundance of energy resources

and the market value of these resources. Some of the variations result from the past history of investment in natural gas and electricity infrastructure. And some of the variations result from implicit or explicit subsidies that often exist in state-owned power enterprises.

The best goal for U.S. energy policy is to achieve clean and secure sources of power in a competitive market environment. Trying to mimic the electricity costs in other countries would be a poor way to achieve this goal.

GEOTHERMAL ENERGY TECHNOLOGY PROGRAM

Question 1. Congress recognizes the need for diversifying our energy supply base and the value of promoting an expanding role for clean, domestic, and renewable energy systems. Indeed, the Energy Policy Act of 2005 (EPAct 2005) includes numerous provisions to support their development and deployment. President Bush not only signed that bill, but also stated his strong commitment to expanding the use of renewables in his State of the Union address.

Geothermal energy systems represent the only baseload renewable energy technology that doesn't depend on rainfall or fuel supplies. This makes geothermal a unique technology that provides an excellent hedge against uncertain fuel prices. The importance of such a hedge against rising and uncertain fuel prices for power generation has become particularly evident in the past 5 years with the power crisis in California and the very high natural gas prices of the past 2 years.

EPAct 2005 includes provisions to encourage the development of those known geothermal resources that are close to economic and those provisions are appropriate for addressing those near term opportunities. However, as with all energy sources, the magnitude of economic geothermal resources are very dependent on technology as well as prices.

What has been the impact of the geothermal technology program on the magnitude of cost-effective geothermal resources (i.e. "proven reserves" of geothermal energy) in the past?

Answer. In the past, industry-coupled drilling, sponsored by the program, resulted in the private development of six commercial geothermal fields. The program pioneered research into binary conversion cycles, which today account for over 200 MWe of generation. Work by the program to handle the hypersaline brines of the Salton Sea geothermal field has resulted in 285 MWe of generation today, while the field has an ultimate potential of more than 2,000 MWe. Over ten years ago, the program worked with industry to understand the accelerated decline of pressure within The Geysers geothermal steam field in northern California. That work led to the strategy of injecting municipal waste water into the field, allowing steam pressure to be maintained while extending the life of this 1,000+ MWe resource.

Question 2. Will continuation of the geothermal technology program's R&D in exploration, characterization, drilling, and systems development expand cost-effective hydrothermal resources in the future? Can the department provide an estimate of the expansion that is possible?

Answer. The Geothermal Program has achieved its key technical objectives. Geothermal is now a mature energy technology. New geothermal projects in the United States are planned for California, Nevada, Idaho, Alaska, Hawaii, Utah, and Arizona. There are 483 megawatts of new power purchase agreements signed in California, Nevada, Idaho and Arizona. Projects under construction, or which have both Power Purchase Agreements and are undergoing production drilling, amount to 547 megawatts in the seven western states. The Western Governors Association geothermal task force recently identified over 100 sites with an estimated 13,000 MWe of power with near-term development potential. USGS is currently updating geothermal resources estimate.

Question 3. Isn't it the case that, as a dispatchable, baseload power source, geothermal offers an excellent complement to wind and solar power systems, all of which provide electricity that is independent of fossil fuel prices?

Answer. Yes, as a baseload power source, geothermal complements intermittent renewable wind and solar energy production.

Question 4. The Secretary has expressed "guarded optimism" about the potential of cost-effective production of oil from oil shale deposits in the west using a technology under development by Shell Oil. While oil represents a particularly valuable form of energy because of our dependence on it for virtually all of our transportation fuels, aren't the total geothermal resources, including the non-hydrothermal resources, in the continental U.S. at least as vast? Given that, shouldn't we continue an R&D program focused on identifying and developing a technology to economically tap these "hot dry rock" resources in the future?

Answer. In terms of total resource potential, the Nation's geothermal and hydrothermal resources are at least as vast as oil shale deposits in the west. The geothermal program has achieved its key technical objectives for known hydrothermal resources and geothermal is now a mature energy technology.

The Department completed the hot dry rock project 10 years ago at Los Alamos, and was successful in addressing technical feasibility. The information is available to the public through OSTI, the information retrieval service of the Department's Office of Science and Technology Information (*http://www.osti.gov/geothermal/index.html*).

NATURAL GAS DISTRIBUTION LINES

Question 1. Can you explain the Administration's rationale for the proposal on p. 127 of the Treasury Department's *General Explanations of the Administration's Fiscal Year 2007 Revenue Proposals* regarding repealing the 15-year depreciation for natural gas distribution lines. It claims the provisions the Congress enacted last year, which I sponsored as free-standing legislation, gives natural gas utilities an unwarranted advantage over competitors such as electric utilities. Can you explain this in view of Sec. 1308 of the Energy Policy Act of 2005, which provides for electric transmission property to be treated as 15-year property, a provision which I also supported?

Answer. Lowering the recovery period for electric transmission lines from 20 years to 15 years, as was done in the Energy Policy Act of 2005, and restoring the 20 year recovery period for gas utility distribution lines, as is advocated in the Administration's FY 2007 budget, is not inconsistent with efficient tax policy. For efficient tax policy to occur, tax law depreciation present values should be proportional with economic depreciation present values. In other words, the time period for depreciation should reflect the average life of the asset. The class life is one measure of the expected useful life for the asset. For both electric and gas assets, the class lives are broken down by transmission and distribution. The class life for both electric transmission and distribution assets is 30 years.

The class life for gas transmission and distribution assets is similar (i.e. 22 years and 35 years, respectively). Thus, one might conclude that gas and electric transmission assets have similar economic lives, while the same is true for gas and electric distribution assets.

If assets have similar economic lives, then their recovery periods should also be the same or similar. Under current law (after enactment of the Energy Policy Act of 2005), recovery periods for electric transmission and distribution assets are 15 years and 20 years, respectively. The recovery period for gas transmission lines is the same as electric transmission lines (i.e. 1 5 years). For natural gas distribution lines placed in service after 2010, the recovery period would be the same as electric distribution lines (i.e. 20 years), but a shorter recovery period (i.e. 15 years) if placed in service before 2011. Having a four year period (2007-2010) in which gas distribution assets receive a shorter recovery period is not likely to generate additional investment, but will likely serve only to distort the timing of such investments. Thus, the Administration feels repealing the 15-year depreciation for natural gas distribution lines is justified to achieve efficient tax policy.

RESPONSES TO QUESTIONS FROM SENATOR FEINSTEIN

ENERGY EFFICIENCY

Question 1a. The President's Budget Requests states "Given America's growing energy needs, we must also make better, more efficient use of our most abundant resource, namely coal."

Mr. Secretary, as you may know, I have been an avid proponent of energy efficiency. We have the technology today to reduce the amount of energy we need to power our homes and businesses. In my opinion, one of the most successful parts of the energy bill tax were the tax incentives offered by Senator Snowe and myself. Those tax incentives were supposed to have gone into effect on January 1. Yet the Department has still not issued guidance to the Treasury Department to implement the tax deductions for commercial buildings.

The commercial tax incentives have the potential to save 45,000 MW after 10 years—equivalent to the current demand in the entire state of California. In addition, they have the potential to save businesses almost $15 billion per year after 10 years in direct bill savings and some $10 billion more in reduced gas prices.

When will the Department issue the regulations for the commercial tax incentives?

Answer. The Department of the Treasury/IRS is responsible for issuing the regulations for the commercial tax incentives. Nevertheless, the Department of Energy has been in regular contact with the Department of the Treasury, providing advice and technical assistance.

Question 1b. The New Buildings Institute submitted a proposal in late August 2005 to help DOE write the implementation regulations. Given the fact that the Department still has not issued the regulations, did the Department err by not asking for assistance in writing the regulations?

Answer. The Secretary of the Treasury is responsible for writing regulations to implement commercial building energy efficiency deductions. The Department of Energy has been providing technical assistance to the Department of the Treasury and the Internal Revenue Service in the development of the regulations. We understand the regulations are nearing completion and should be available soon. The Department met with representatives of the New Building Institute and appreciates their offer to help.

Question 1c. The President's Budget Request states "Given America's growing energy needs, we must also make better, more efficient use of our most abundant resource, namely coal."

Mr. Secretary, as you may know, I have been an avid proponent of energy efficiency. We have the technology today to reduce the amount of energy we need to power our homes and businesses. In my opinion, one of the most successful parts of the energy bill tax were the tax incentives offered by Senator Snowe and myself. Those tax incentives were supposed to have gone into effect on January 1. Yet the Department has still not issued guidance to the Treasury Department to implement the tax deductions for commercial buildings.

The commercial tax incentives have the potential to save 45,000 MW after 10 years—equivalent to the current demand in the entire State of California. In addition, they have the potential to save businesses almost $15 billion per year after 10 years in direct bill savings and some $10 billion more in reduced gas prices.

Given the fact that the Department has recognized the importance of energy efficiency, will it support an extension of the energy efficiency tax credits that were included in the energy bill?

Answer. The Administration will evaluate its position on introduced legislation at the appropriate time.

GEOTHERMAL ENERGY

Question 2. Geothermal energy could provide the West with an additional 13, 000 megawatts of baseload energy. According to the Western Governors Association, 5,600 megawatts of geothermal energy could be commercially developed in the next 10 years. That would be on top of the 2,000 megawatts that are already produced in California, accounting for approximately 5% of California's energy needs.

The National Research Council's 2000 report entitled *Renewable Power Pathways* stated that "Geothermal energy is a widespread but underutilized renewable energy resource . . . The current level of R&D support for geothermal technologies is not sufficient to develop the reservoir engineering science and drilling technologies that would bring down development risks and costs . . . Government incentive programs are important to the development and deployment of geothermal-based technologies."

Why would the Department of Energy choose to eliminate funding for a program given the clear recommendation from the National Research Council and the need for additional clean sources of energy?

Answer. The highest priority of the geothermal industry has been the attainment of the production tax credit, which the passage of the Energy Policy Act of 2005 provided. In addition, the Energy Policy Act streamlined geothermal leasing and changed the royalty structure to provide incentives for local governments to promote geothermal development. The Energy Policy Act also mandated that the U.S. Geological Survey update maps providing detailed geothermal resource data. Together, these statutory changes will spur geothermal development without the Department's Geothermal Program.

The Geothermal Program has also achieved its key technical objectives. Geothermal is now a mature energy technology. New geothermal projects in the United States are planned for California, Nevada, Idaho, Alaska, Hawaii, Utah, and Arizona. There are 483 megawatts of new power purchase agreements signed in California, Nevada, Idaho and Arizona. Projects under construction, or which have both Power Purchase Agreements and are undergoing production drilling, amount to 547 megawatts in the seven western states. The Western Governors Association geo-

thermal task force recently identified over 100 sites with an estimated 13,000 MWe of power with near-term development potential.

NUCLEAR WASTE

Question 3a. The United States stopped reprocessing under the Ford Administration, and reprocessing was banned under the Carter Administration in response to India's nuclear explosive tests in 1974. At the time, several other countries, including South Korea and Germany, were considering reprocessing, but did not acquire it.

What are the implications of the U.S. reversing a thirty-year policy and now promoting reprocessing in certain countries?

Answer. GNEP builds upon and goes beyond where previous U.S. policy ended by proposing a comprehensive approach to the international fuel cycle that includes next-generation recycle and reactor technologies as one of its elements. GNEP does not promote spent fuel recycling where it has not already occurred on a large commercial scale. Rather, the GNEP fuel cycle is predicated on limiting recycling technologies to a small number of fuel cycle nations. GNEP also promotes the use of advanced safeguards and technologies that will not result in separated plutonium, rather than supporting the status quo of existing separation technologies that result in stocks of separated plutonium.

But the broader purpose is to develop an alternative to managing the international fuel cycle that is affordable and improves waste management, safety and proliferation resistance. Cradle-to-grave fuel cycle services would offer an attractive alternative to current fuel supply arrangements and help prevent the spread of sensitive fuel cycle capabilities. The most sensitive facilities and materials would be limited to advanced nations with reliable nonproliferation credentials.

Question 3b. The United States stopped reprocessing under the Ford Administration, and reprocessing was banned under the Carter Administration in response to India's nuclear explosive tests in 1974. At the time, several other countries, including South Korea and Germany, were considering reprocessing, but did not acquire it.

If the United States made a decision to proceed with reprocessing its commercial spent nuclear fuel, what impact would that have on the Administration's efforts to limit the spread of reprocessing and enrichment technologies around the world, and to convince other countries not to pursue this technology themselves?

Answer. Countries with advanced and robust commercial nuclear programs have been using separated plutonium in their civil nuclear programs for well over a decade and there is every indication that this practice will continue and increase with time. The prior U.S. policy on reprocessing has not led to a decline in the use of plutonium in commercial fuel in these countries. On the contrary, it can be persuasively argued that the long absence of the United States from this aspect of the commercial nuclear industry has eroded our ability to provide leadership in making nonproliferation a key objective in this area.

Consistent with the President's nonproliferation policy, the overall thrust of GNEP is to provide attractive options in the form of reliable fuel services, including fuel supply and take back for reactor nations that refrain from costly investments in enrichment and reprocessing. Returned spent fuel would be recycled and the transuranics including plutonium would be "burnt" in specially designed reactors located in a small group of countries that already possess reprocessing and fast reactor technology. Over the long term, GNEP aims to phase out separated plutonium from the civil nuclear economy.

Question 3c. The United States stopped reprocessing under the Ford Administration, and reprocessing was banned under the Carter Administration in response to India's nuclear explosive tests in 1974. At the time, several other countries, including South Korea and Germany, were considering reprocessing, but did not acquire it.

Wouldn't this promote a double-standard that will undermine our non-proliferation efforts?

Answer. GNEP does not promote a double standard. GNEP does, however, recognize the reality that some states have developed a full complement of fuel cycle facilities and others have not. Our approach provides an opportunity for the U.S. to both lead and participate in the global expansion of safe and clean nuclear energy, while at the same time greatly advancing our non-proliferation goals. A global expansion of nuclear energy is underway and will happen with or without U.S. leadership or participation. GNEP seeks to limit recycle technology to the few countries in the global community that already have mature nuclear fuel cycles including reprocessing. One of the goals of GNEP is to institutionalize a small set of fuel cycle

states and a much larger set of reactor states and limit the spread of enrichment and reprocessing technologies to those countries that already possess the technology. The economic and political incentives that will be provided to countries that refrain from developing enrichment and reprocessing technologies will be substantial. These incentives include a solution to the reactor states' spent fuel disposal problems, which are significant. GNEP's economic and institutional incentives are expected to be sufficiently attractive so as to draw significant attention to countries that decline to participate.

Question 3d. The United States stopped reprocessing under the Ford Administration, and reprocessing was banned under the Carter Administration in response to India's nuclear explosive tests in 1974. At the time, several other countries, including South Korea and Germany, were considering reprocessing, but did not acquire it.

What is the target list of countries that must agree to forego reprocessing under the Administration's proposal?

Answer. There is no target list. The Administration believes that the economic benefits of such an arrangement between fuel cycle supplier nations and reactor nations could be made sufficiently compelling that all reactor nations that did not have ulterior motives for developing indigenous fuel cycle facilities would willingly participate.

Question 3e. The United States stopped reprocessing under the Ford Administration, and reprocessing was banned under the Carter Administration in response to India's nuclear explosive tests in 1974. At the time, several other countries, including South Korea and Germany, were considering reprocessing, but did not acquire it.

Is there any realistic indication that these countries will ultimately agree to forego indigenous reprocessing and allow certain other countries to reprocess their spent fuel?

Answer. The issue of spent fuel management and the back end of the fuel cycle continues to be one of the more difficult issues to resolve. The required investments for recycle capability and repository development are substantial and not justifiable for smaller nuclear economies. GNEP proposes to take advantage of this economic fact to create compelling incentives to prevent the further spread of reprocessing technology, by providing reliable fuel services to resolve this issue in exchange for agreement to refrain from developing indigenous recycle capability. Allowing for a sustainable expansion of peaceful nuclear energy while avoiding the problem of proliferation requires reconsideration of how the international fuel cycle operates. Under GNEP, the United States and our fuel cycle partners will demonstrate technologies that make spent fuel take back feasible on a wider scale than is currently the case.

OIL DEPENDENCE

Question 4a. In the State of the Union, the President referred to breaking America's oil addiction by reducing the amount of oil we import from the Persian Gulf by 75% by 2025. That's a long time away from now—and our constituents are stuck with high energy costs today.

If the Administration is serious about breaking our addiction to oil, why is it proposing to slash the Vehicle Technologies Program by 9%?

Answer. Transportation research remains a key factor in our plans to decrease the Nation's dependence on foreign oil, and DOE's request strongly supports this goal. Although it appears that we are asking for less money in the Vehicle Technologies Program, a closer look at the details shows that the FY 2006 appropriation contains more than $20 million in congressionally directed activities that do not directly support the Vehicle Technologies Program's mission and goals. Once an adjustment is made for these earmarks and program transfers, it becomes clear that DOE's FY 2007 budget request for goal-directed R&D is level with the FY 2006 appropriation. Additionally, this year's request realigns some internal priorities by placing greater emphasis on those research activities with the greatest potential for oil savings, particularly to increase funding for the development of lithium-ion batteries and other technologies for plug-in hybrid vehicles.

Question 4b. In the State of the Union, the President referred to breaking America's oil addiction by reducing the amount of oil we import from the Persian Gulf by 75% by 2025. That a long time away from now—and our constituents are stuck with high energy costs today.

Has the Administration developed shorter-term goals and milestones by which to reach the larger goal in 2025? How are those goals reflected in the budget?

Answer. During the State of the Union address, President Bush announced (and the Budget reflects) an ambitious program to accelerate our research to make cellulosic ethanol commercially competitive by 2012, to improve batteries used in hybrid cars and make hydrogen fueled vehicles commercially available. If we successfully meet those goals, we will significantly reduce the amount of oil that we must import each day to meet our transportation needs. The Administration believes the best approach to reducing America's reliance on imported oil is to develop new technologies that will fundamentally change the needs of our transportation sector while maintaining an environment that encourages continued economic growth.

It's worth noting that, with careful consideration of economic growth, safety, technological feasibility, and other factors, the Administration increased Corporate Average Fuel Economy standards for light trucks for Model Years 2005-2007, saving significant amounts of petroleum. The Administration recently proposed further increases for Model Years 2008-2011 that are expected to save 7.8 billion gallons of gas over the lifetime of the vehicles.

WEATHERIZATION

Question 5. In a complete reversal of the Administration's ten-year commitment to the Program, contained in the 2000 National Energy Policy, the proposed budget calls for a $78 million reduction in funding for 2007 for weatherization.

This unwarranted reduction will force states to deny much needed energy efficiency services to approximately 30,000 low-income, elderly and working poor families next year. To date, the President has only provided approximately 26 percent of what he committed to in 2000.

Weatherization is a particularly good investment of federal dollars. Once weatherization services are provided, the average family saves about $440 per year (based on current energy prices). The effect of these efficiency services (like insulation, furnace replacement, air infiltration reduction, etc.) lasts more than 15 years in most case. This means that each family could save more than $6,600 over the life of the services installed with a modest average investment of only $2,900. The 30,000 families who will be denied this year will have to spend an additional $217.8 million to pay for energy that could have been saved if the homes were weatherized in 2007. The $78 million reduction that is to be reprogrammed for research and development cannot claim this kind of return on investment.

Congress believed that this program deserved additional funding which is why the Energy Bill that the President signed into law last August authorized $600 million for FY07 for weatherization.

Why does the administration propose reducing the Weatherization Program by more than 30% in 2007 when low-income families are being hit by high energy prices?

Answer. From 2002 through 2006, the Administration requested a cumulative total of $1.359 billion for the Weatherization program, nearly doubling the baseline funding assumptions (using 2001 appropriations). Unfortunately, Congressional appropriations from 2002 through 2006 fell short of the Administration's requests by a cumulative total of $208 million. Nevertheless, increased appropriations driven by the President's 2002 through 2006 Budgets led to energy and cost savings for hundreds of thousands of the neediest low-income families.

The Administration made very difficult choices in developing the FY 2007 Budget. Reducing America's growing dependence on foreign oil and changing how we power our homes and businesses are among the Department's highest priorities, as outlined in the President's Advanced Energy Initiative.

The Department's benefits models indicate that the Weatherization Program does not provide significant energy benefits compared to the potential benefits of other programs where we are increasing our investments.

RESPONSES TO QUESTIONS FROM SENATOR JOHNSON

Question 1. The FY 2007 Budget Request provides that the interest rate for future debt obligations owed to the Treasury by Southwestern, Southeastern, and Western for all power-related investments whose interest rates are not specified in law be set at the "agency rate" governmental corporations borrow from the Treasury, similar to how current law sets the interest rates for BPA's borrowing from the Treasury.

What is the purpose of this change?

Answer. This proposal will bring the interest rates on certain Southeastern, Southwestern and Western investments in line with the interest rates paid by Bonneville Power Administration and Government corporations, and will increase rev-

enue to the U.S. Treasury an average of approximately $2.4 million annually from 2007 through 2011.

Question 2. The Budget Request states that the "agency rate" is the rate at which governmental corporations borrow from the Treasury. What governmental corporations borrow at that rate? How is the agency rate calculated?

Answer. The "agency rate" is determined in capital markets. It is the rate at which Government corporations (such as Tennessee Valley Authority) and Government-sponsored enterprises (such as Fannie Mae, Freddie Mac and the Farm Credit System) borrow in the market. The rate that Bonneville Power Administration pays to Treasury on its bonds is an approximation of this market rate.

Question 3. The Budget Request states that this rate is "similar to how current law sets the interest rates for BPA's borrowing from the Treasury." What are the differences between the "agency rate" and BPA's rates?

Answer. The "agency rate" is the rate at which Government corporations and Government-sponsored enterprises borrow in the capital market. Bonneville Power Administration issues bonds to Treasury rather than in the capital market. By law, the rate on Bonneville's Treasury bonds must be "comparable to the rates prevailing in the market for similar bonds issued by Government corporations." Therefore, the rate Bonneville pays on its bonds is an approximation of this market rate.

Question 4. Southwestern, Southeastern, and Western are not governmental corporations. They don't borrow from the U.S. Treasury as BPA does. What is the rationale for imposing this interest rate on federal agencies that are markedly different from the examples the Administration has cited?

Answer. Bonneville, Southeastern, Southwestern and Western Area Power Administrations all market Federal hydropower and presumably Treasury's cost of providing funds for their operations is the same.

Question 5. How does the Administration intend to implement this change?

Answer. This change will be implemented administratively through a public process to amend the interest rate provisions outlined in DOE Order RA6120.2, which governs PMA rate setting and repayment. In addition, the PMAs will conduct public processes, as needed, to modify the power rates for the affected power projects.

RESPONSES OF MICHAEL DALE TO QUESTIONS FROM SENATOR BINGAMAN

Question 1. As I understand it, the Department of Labor certifies that there is a shortage of available labor in a given area before H2B visas are issued to an employer wishing to work in that area. However, the H2B contractors reportedly compete with local contractors for Forest Service reforestation projects, which seems to call into question the Department's determination that there was a shortage of labor. Do you have any insight into how the Department of Labor's process for certifying a shortage of available labor falls short? Do you have any suggestions on how it can be improved?

Answer. A large part of this problem stems from the manner in which the H2B program is implemented by the Department. In theory, H2B workers are available only to employers who have an existing need for workers that cannot be filled by qualified domestic workers. Whether there are U.S. workers available is supposed to be determined by testing the labor market by recruiting employees at prevailing industry standards. If an insufficient number of workers respond to the job offer, the Secretary certifies the shortfall, in effect authorizing the admission of a like number of H2B temporary workers for these jobs.

In reality this labor market test is a charade. To begin with, candid observers of the industry will readily admit that, at the time that they apply for labor certification for H2B workers, most reforestation contractors don't really know what work they will have available or where. They apply for workers to perform contracts they hope to obtain. They apply for workers "on spec" as a DOL administrator once put it. This causes a number of problems. Whatever minimal recruitment of U.S. workers takes place prior to the H2B application is not a serious effort to find and hire workers, since the employer does not yet know when, where, or even if, they will be needed.

Because of the casual manner in which EIA treats the requirement that employers try to recruit U.S. workers, the recruitment is seldom successful in finding many workers. All that the DOL requires of an H2B applicant is to list the work with the Job Service and place an advertisement for a few days in a local paper in the community where the work will begin. This advertisement will appear months before the work is "available" so finding anyone to do the work at that point in time is not very probable. Since DOL permits forestry contractors to string together an "itinerary" of different work contracts in different locations within a single H2B ap-

plication, a person who was willing and qualified to work, for example, on the Lincoln National Forest, might also be required by the employer to commit to work in the Bitterroot National Forest in the Northwest. Workers in New Mexico will be unlikely to want to travel to Idaho to work, and the advertisement for the work will never appear in Idaho. In the late 1990's EIA agreed that these itinerary applications could not include work in more than two adjacent DOL regions, but this policy is much less meaningful as DOL has consolidated its regional offices. The requirement that a worker agree to travel far from home makes the jobs much less attractive to U.S. workers.

By contrast, under the H2A agricultural worker regulations, a prospective employer will generally be recruiting workers for specific farming operations, known well in advance. The employer is required to list the jobs not only with the Job Service locally, but in areas of labor surplus elsewhere in the United States, as well. Agricultural employers must also engage in affirmative recruitment, defined as taking those actions normal to employers in the industry who are seeking workers. This has been interpreted to include advertisement in Spanish language print media and radio, sending recruiters to labor supply areas, etc. Then, if qualified U.S. workers show up at the job looking for work at any time during the first half of the season, they will have preference for work over H2A workers already on the job. This creates an incentive for employers to truly to seek out and find available U.S. workers, since these workers may apply later and replace H2A workers.

Having been "unable" to find U.S. workers through the paltry required recruitment process, the forestry contractor then can later hire H2B workers to do whatever work the contractor has been successful in obtaining, often by bidding with the government's land management agencies against other contractors using U.S. workers. At this point, no consideration is given to whether the successful bidder will be using domestic or H2B employees, even though U.S. workers have a theoretical preference for the work. If all of the hoped-for work does not materialize, the H2B contractor is not obligated (as is required under H2A regulations) to guarantee that at least of promised work will be available. The contractor can either simply abandon the workers, or contract them to work in unauthorized employment, again in competition with domestic workers, but without even the pretext of having sought U.S. workers.

This all happens, in significant degree, because the Department of Labor has refused to honor its own commitment to be guided in its consideration of H2B applications by the policies promulgated under the H2A program, 20 C.F.R.655.3(b). It has never developed regulations comparable to those in place in the H2A field, and does little to protect either the wages and working conditions of domestic worker or the foreign workers, either.

Several rather straightforward steps could be taken to ameliorate this situation.

1) The Department of Labor could develop standards under H2B that would be roughly comparable to the requirements imposed on H2A employers. Where there are particular differences in forestry, the rules could vary, but the basic protections—paid transportation, free housing, positive recruitment, 3/4 guarantee—should be the same.

2) Since the Migrant and Seasonal Agricultural Worker Protection Act, 29 U.S.C. § 1801 *et seq.,* applies to forestry work, and since that act requires that labor recruiters disclose in writing the terms and conditions of employment being offered, at least in theory, the pre-application recruitment of U.S. workers by a contractor applying for H2B certification should be accomplished using a statement fully disclosing contract terms being offered. It should be no great burden then to require that an H2B application for reforestation workers include the disclosure statement used to try to recruit U.S. workers. Since the use of such a disclosure statement would create an enforceable working arrangement with workers who received the disclosure, this would reduce the incentive to apply for H2B workers at a time that the contractor is unsure of whether there is work for them.

3) The Department of Labor should not allow contractors to link together farflung job opportunities in an itinerary application, thereby freezing out local workers who are willing to work in their local vicinity, but don't want to travel thousands of miles away from their home. If such applications are permitted, at the very least, local recruitment in each area of employment should be required, not just where the work begins, with U.S. workers being eligible to work on those parts of the contract that are convenient to them in preference over H2B workers.

4) Forestry agencies should require that contractors disclose at the time of bid whether they intend to apply to import temporary H2B workers to perform the

contract. Since U.S. workers are supposed to have preferred access to this work, bidders who are not planning to use H2B workers should be given preference in bid awards over contractors who plan to do the work using H2B workers.

5) Contract bids should be designed by the forestry agencies, to the extent possible, to create longer term, local job opportunities, rather than short term spot work.

Question 2. Similarly, the Department of Labor makes a determination of the prevailing wage in a given area. However, in many instances, that wage reportedly falls short of what is fair or adequate. Do you have any insight into how the Department of Labor's process for determining a prevailing wage falls short? Do you have any suggestions on how it can be improved?

Answer. Roughly a year or so ago, the Department of Labor administratively changed its method of determining prevailing wage for H2B applications in ways that we do not fully understand. The new methodology, anecdotally, seems to produce a lower prevailing wage rate. A group of attorneys who work with H2B issues are currently looking at this methodology and will forward insights and recommendations that may be developed in this process.

Question 3. The Forest Service contract clauses issued on January 4, 2006, require contractors to train their employees in the safe operation and use of equipment, but it doesn't appear that there are any standards or certifications to ensure that all the workers are appropriately trained. Should the agencies develop a uniform training and certification program so the Forest Service can verify that appropriate training has been provided and so the contractors know what is expected of them? I note that the Forest Service already does this in the context of wildland fire fighting and that British Columbia reportedly has instituted training and certification of its reforestation crews.

Answer. This is very hazardous work, and reports of injuries, especially from chain saws, are frequent. I am unfamiliar with the British Columbia program, but the training for fire crews, while sometimes uneven, clearly has saved lives. Requiring crews to be safety certified would also help limit contract awards to less professional operations. For these reasons, I tend to favor this suggestion.

However, the most serious injuries to reforestation workers are caused by vehicle accidents. A very simple, less costly, regulatory step would be for the Department of Labor, using its regulatory powers under the Migrant and Seasonal Agricultural Worker Protection Act, to require that vehicles used to transport workers have operational seatbelts.

Finally, I would like to take the liberty to reemphasize the importance of some of the other recommendations I made at the hearing. Unfortunately, this is not the first time that this issue has been looked at by the Congress, and I was struck by how similar the agency responses were to prior efforts at reform. I am submitting, by surface mail, copies of some of the correspondence and testimony from earlier efforts.* It is discouraging to realize how cyclical both the recommendations and agency responses have been.

From this experience, it seems to me three principles for effective reform can be extracted: 1) efforts must be interagency, and buck-passing is an unacceptable response; 2) efforts must be sustained, and probably supported by structural mechanism that keep the issue from sliding back to the back burner when public intensity dies down, and 3) workers must have access to advocacy on their behalf that is able to assert their interests independent of other agency imperatives. These observations lead to our recommendations that 1) an inter-agency working group be created that is charged with working out plans of action and regularly reporting back progress to Congress, and 2) that H2B workers be made eligible for representation by Legal Services Corporation-funded legal services programs.

*The correspondence has been retained in committee files.

APPENDIX II

Additional Material Submitted for the Record

STATEMENT OF THE INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA

The Independent Petroleum Association of America (IPAA), represents over 5,000 producers of domestic oil and natural gas. Independents drill 90 percent of the nation's oil wells and produce 85 of the nation's natural gas and 60 percent of domestically produced oil. IPAA is concerned that the Administration's budget request for the Department of Energy's oil and natural gas technologies programs for Fiscal Year 2007 (FY2007) will result in the loss of key technology developments to improve domestic oil and natural gas production.

This is the second year that the Administration has proposed to terminate funding for these vitally important programs, eighty-five percent of which historically has focused on exploration and production activities associated with independent producers. In most instances, these companies do not have access to the in-house technology development capabilities of the larger, integrated, multi-national oil companies. Therefore, federally funded research and development (R&D) is instrumental in maintaining a viable, robust domestic producing sector.

In addition to "zeroing out" these R&D programs, the Administration has requested zero funding for R&D programs related to methane hydrates development and technology development associated with the non-conventional onshore/ultra-deepwater/small producer program authorized in the Energy Policy Act of 2005.

Full, consistent funding for development of these programs at DOE is essential to meet the President's objectives to reduce on dependence foreign sources of energy. In the past, these programs have provided a variety of functions, primarily focusing on domestic exploration and production research and development activities, resulting in sustaining and in most instances, increasing domestic oil and gas production. Such research and development activities, conducted by universities, Department of Energy laboratories and the private sector have culminated in the development of exploration and production (E&P) technologies, which have resulted in an increase in production of product, with a much smaller environmental footprint, yet in a more environmentally sensitive manner. These benefits were well articulated by the Department of Energy in its October 17, 2005 statement when it funded several key projects:

DOE SELECTS PROJECTS FOR GAS/OIL RESEARCH

GOAL IS TO BOOST RECOVERY OF UNCONVENTIONAL RESOURCES AND MINIMIZE ENVIRONMENTAL IMPACTS

WASHINGTON, D.C.—Secretary of Energy Samuel W. Bodman today announced that the Department of Energy (DOE) will provide $10.7 million to fund 13 research and development projects that focus on recovering large, unconventional gas and oil resources and improving the environmental aspects of drilling for gas and oil. The projects have a total value of $16.3 million, including $5.6 million in co-funding from industry and academic partners.

"This Administration continues to seek out and develop new energy options to support our growing economy," Secretary Bodman said. "The projects we are funding today are an investment in our Nation's energy security and economic security, and will help us obtain the maximum benefit of our domestic energy resources in an environmentally sensitive way."

Most of the research projects focus on boosting recovery of unconventional natural gas, which can be found in coal seams, low-permeability or "tight" sandstones, and ultra-deep natural gas resources found more than 15,000 feet underground. Combined, those sources of unconventional natural gas are estimated to be approxi-

mately 700 trillion cubic feet (Tcf), compared to an industry estimate of 190 Tcf in conventional natural gas reserves.

Presently, unconventional natural gas accounts for nearly one quarter of total domestic supply, a share that will rise with future technological advancements such as those being investigated by the funded projects. Six of the projects will improve the efficiency of drilling, appraising, and production of low-permeability formations by collecting, analyzing, and publicizing a variety of critical data. This will enable operators to generate less waste and extract more gas from fewer wells.

The Energy Department is also researching the difficult environments encountered while drilling ultra-deep gas wells—another untapped resource for additional natural gas. Three projects will focus on "smart" drilling systems that will withstand the extreme temperatures, pressures, and corrosive conditions of deep reservoirs. Two other projects will perfect drilling techniques to lessen environmental impact and lower costs.

The 11 cost-shared projects targeting natural gas supply are described below:

- *University of Kansas Center for Research Inc. (Lawrence, Kan.)* Researchers will evaluate and publish data concerning reservoir and rock formation properties. The data will assist operators in making efficient drilling decisions regarding tight gas sandstones (TGS). This study will analyze five Rocky Mountain basins that represent the biggest part of the total Rocky Mountain TGS resource, which in turn is 70 percent of the Nation's TGS resource base. (DOE share: $411,030; project duration: 24 months)
- *New Mexico Institute of Mining and Technology (Socorro, N.M.)* Researchers will collect, integrate, and analyze a variety of well and reservoir-rock physics data related to two tight gas reservoirs, the Mesa Verde and Dakota formations in the San Juan Basin. (DOE share: $516,000; 36 months)
- *West Virginia University Research Corp. (Morgantown, W.Va.)* Researchers will simplify, accelerate, and digitize the data collection process for independent producers interested in developing tight gas reservoirs in the Appalachian Basin. Data will cover five significant areas in the basin (DOE share: $566,729; 36 months)
- *Texas A&M University (College Station, Texas)* Researchers will develop new methods for creating extensive, conductive hydraulic fractures in unconventional tight gas reservoirs. After assessing a wide range fracture treatments conducted in the field, researchers will develop design models for implementing optimal fracture treatments. (DOE share: $1.2 million; 36 months)
- *University of Texas (Austin, Texas)* Researchers will enhance 3-D hydraulic fracture models to help operators design and optimize energized fracture treatments in a systematic way. They will test the enhanced model by designing and executing energized hydraulic fracture treatments in tight gas sands. (DOE share: $985,796; 36 months)
- *BC Technologies Ltd. (Laramie, Wyo.)* Researchers intend to economically remove impurities from coalbed natural gas (CBNG) produced water to make it suitable for crop irrigation and livestock and wildlife watering. The projects intend to treat CBNG produced water in Wyoming's Greater Green River Basin at the wellhead with an injectable purifier. (DOE share: $585,444; 24 months)
- *TerraTek Inc. (Salt Lake City, Utah)* Researchers intend to slash the cost of deep drilling, defined as drilling from 15,000 to 30,000 feet, and improve drilling penetration rates by developing an ultra-deep drilling simulator to test drilling cutters and muds at 30,000 psi and 250 °C. The simulator will allow new environmentally benign fluids to be designed and tested. (DOE share: $1.4 million; 18 months)
- *Oklahoma State University (Stillwater, Okla.)* Researchers will design and build a downhole microcomputer system with peripherals that can operate at 275 °C. This will allow operators to take critical downhole measurements and steer the drill bit, reducing the risk of dry holes and well blowouts. (DOE share: $578,391;18 months).
- *Dexter Magnetic Technologies Inc. (Rockwall, Texas)* Researchers will develop, test, and commercialize a downhole power source capable of operating at temperatures greater than 215 °C, and will also develop an advanced turbine generator that uses hydraulic power from the drilling fluid as energy to turn a generator. (DOE share: $490,646; 36 months)
- *Noble Wellbore Technologies Inc. (Sugar Land, Texas)* Researchers will develop a rotary steerable system that costs less than half of current models. Steerable systems, while more expensive than conventional drilling systems, enable the operator to guide the drillbit to preprogrammed targets automatically. This al-

lows higher penetration rates, greater lengths for horizontal-well sections, and easier well completions. (DOE share: $849,670; 24 months)

- *Texas A&M University (College Station, Texas)* Researchers will incorporate current and emerging technologies into a clean, environmentally-friendly drilling system that can be used to find and produce natural gas in the lower 48 states. The project also includes establishing a joint venture of industry, academic, and government partners to support development of such a zero-impact drilling system. (DOE share: $1.4 million; 36 months)

Two additional projects will significantly improve CO_2 enhanced oil recovery technology in novel ways:

- *Mississippi State University (Starkville, Miss.)* Researchers intend to improve oil recovery by up to 100 percent by using environmentally friendly nutrients to stimulate the growth of microorganisms so that water and CO_2 are diverted to previously unswept reservoir zones. (DOE share: $900,000; 36 months)
- *Texas A&M University (College Station, Texas)* Researchers plan to develop efficient tools and a systematic work flow for improved oil reservoir characterization and modeling. The technology will be demonstrated in a CO_2 flood in the Permian Basin of West Texas. (DOE share: $785,846; 36 months).

Similarly, potential development of methane hydrates and non-conventional onshore/ultra-deepwater represents huge potential for supplying America's growing natural gas needs. In the case of methane hydrates, the U.S. Geological Survey (USGS) estimates the U.S. to have about 200,000 trillion cubic feet of methane hydrate, while the ultra-deep area alone will tap 1900 trillion cubic feet of technically recoverable reserves—enough to meet 60 years of demand at current rates of consumption.

Also of huge importance is the role that DOE's programs play in the training and development of qualified people for the oil and gas sector, the lack of which continues to grow at an alarmingly rapid rate. The DOE oil and natural gas programs provide vital support to petroleum engineering departments across the country. According to a letter dated April 4, 2005 from the University of Texas' Department of Petroleum and Geosystems Engineering to the Subcommittee on Energy and Water Development Appropriations, ". . . our ability to retain the best faculty who are needed to train Petroleum Engineers for the coming decades depends entirely on our being able to provide research funding to the faculty." The letter goes on to say, "Lacking this opportunity, there will not be many viable petroleum engineering programs left in the U.S." Ironically, this statement is reflective of goals that are outlined in the recently introduced Protecting America's Competitive Edge Act (PACE), and the President's American Competitiveness Initiative.

IPAA commends the President's laudable goal expressed in his recent "State of the Union" address, in which he laid out a "game plan" of appreciably reducing our dependency on foreign sources of oil by 2025. However, our nation's economy is currently fossil fuel "dependent"—65 percent of domestic energy supply coming from oil and natural gas—and will continue to be for the foreseeable future. Therefore, the nation is at a time when concern over increasing dependence on foreign oil is at an all time high, escalating fuel prices are running roughshod over the American consumer in the form of home heating bills and gasoline prices and businesses are relocating and taking valuable jobs overseas with them in the pursuit of affordable fuel costs. The Administration's failure to recognize the importance of investing in oil and natural gas R&D to develop critically needed recovery technologies is all the more perplexing. Domestic oil and natural gas reserves should be "front and center" in any balanced national energy policy, along with renewables, coal and nuclear. Yet, the Administration would essentially eliminate oil and natural gas from DOE's energy portfolio.

IPAA urges the Committee to support full funding for these vitally important programs.

Statement of Pete Rose, President, American Association of Petroleum Geologists

To the Chair and Members of the Committee: Thank you for this opportunity for the American Association of Petroleum Geologists (AAPG) to provide its perspective on the fiscal year 2007 budget request for oil and gas research and development (R&D) programs within the Committee's jurisdiction. The Administration's budget contains significant reductions for the Department of Energy (DOE), Office of Fossil Energy, including the elimination of the oil and gas technology programs. AAPG re-

quests restoration of these DOE Fossil Energy oil and gas technology programs as a matter of national policy.

In addition the budget language also proposes to repeal the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund of the recently signed Energy Policy Act of 2005. AAPG is deeply concerned about establishing the precedence by efforts to dismantle, piecemeal, provisions of that landmark legislation—the first update of U.S. energy policy in more than a decade.

AAPG applauds the Administration's efforts to enhance research in areas that diversify the options to supply energy in our economy. AAPG supports the continued efforts to develop technologies to conserve energy and technologies that will permit the economy to perform more efficiently with reduced energy input. However, as a professional organization, AAPG's members understand that fossil fuels will continue to be a mainstay of the world's energy economy and will provide many of the raw materials that allow us to function in our modern world.

AAPG, an international geoscience organization, is the world's largest professional geological society representing over 30,000 members. The purpose of AAPG is to advance the science of geology, foster scientific research, promote technology and advance the well-being of its members. With members in 116 countries, AAPG serves as a voice for the shared interests of petroleum geologists and geophysicists in our profession worldwide. Included among its members are numerous CEOs, managers, directors, independent/consulting geoscientists, educators, researchers and students. AAPG strives to increase public awareness of the crucial role that geosciences, and particularly petroleum geology play in energy security and our society.

DOE FOSSIL ENERGY RESEARCH AND DEVELOPMENT

AAPG strongly feels the Department of Energy's (DOE) Fossil Energy research and development (R&D) budget funding for Oil Technology R&D and Gas Technology R&D in the Office of Fossil Energy and the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund of the recently signed Energy Policy Act of 2005 are vital for a viable domestic industry in the near-mid-and long-term.

Historically, members of Congress have continually emphasized the need for a comprehensive energy policy containing a strong R&D component. AAPG recognizes the importance of maintaining a strong domestic petroleum industry. Our members support and emphasize the need for continuing efforts in R&D in order to sustain the standard of living U.S. citizens have earned and expect. While the price of crude oil is established by a global market, the costs of exploration, development, and production are influenced strongly by the application of discoveries in geosciences and new developments in technology. Thus, focused R&D can make a significant contribution to sustaining our domestic petroleum industry and to national energy security.

The expanding global economies, including the United States, China and India, place increasing demand on available global energy production capacity. Now, perhaps more than any time in the history of the industry, accelerating technology development and the related opportunities for expanding the base of trained geoscientists available to the industry is critically important. It is also important to recognize the leadership role of the United States in technology development and deployment on the global economy. Commercial export of those technology innovations provides jobs and business opportunities for domestic companies servicing the international oil and gas community.

While our dependence on crude oil and natural gas has changed little since the "energy crisis" of 1973, public and private funding of R&D for these commodities has declined significantly. Many of the major companies and some companies in the related service industry, that once maintained strong programs in R&D, have disappeared through mergers and acquisitions. Others have replaced or retooled some of those R&D activities with technical-service functions, primarily in support of their international activities. In addition, federal funding for R&D programs has declined significantly. While some states, private foundations, smaller companies, and independents are continuing to support R&D in oil and gas, the amount is woefully inadequate to meet the needs of the domestic industry. Thus, absent adequate public support for these endeavors, the continuing flow of new discoveries in the geosciences and new technological breakthroughs that will be needed to continue to support a viable domestic industry in the 21st century will not occur.

Our nation is the world's largest consumer and net importer of energy. According to the Energy Information Administration, during the first nine months of 2005, the U.S. consumed 20.6 million barrels of oil per day, with as much as 12.9 million barrels supplied by imports of crude and products. Our national energy and economic

security depends on a vibrant domestic oil and gas industry. Independent producers drill 90 percent of domestic oil and natural gas wells, produce approximately 85 percent of domestic natural gas and produce about 65 percent of domestic oil. Domestic production creates jobs, produces tax revenue, provides royalty income to hundreds of thousands of mineral owners, and contributes to economic development in producing areas (mostly rural) of the nation.

Federal funding of R&D increases the potential for incremental domestic oil and gas supply, and it is not a subsidy. Almost 85 percent of the jointly-funded R&D and technology transfer programs carried out by universities, state agencies and independent companies are focused on the development of new reserves by domestic independent producers. R&D programs, such as those designed for development of unconventional tight sandstone and shale reservoirs, develop and demonstrate new and innovative technologies. These technologies are used to extend the life of existing oil and gas reservoirs as well as to explore and develop reserves such as the U.S. supply of unconventional gas, which was largely driven by focused federal spending and tax incentive programs. As technology evolves, today's unconventional oil and gas reserves are tomorrow's conventional reserves. It is more important now than ever that the U.S. leverage its investment to find new sources of oil and gas-the unconventional reserves of tomorrow.

Today, revolutionary oil and gas technology is seldom available in the market at any price. Irrespective of the price of oil and gas, procurement of new technologies will be a continuing challenge for domestic U.S. oil and gas producers. Private sector R&D is typically conducted by major international companies with a strong focus on international projects in super giant offshore fields with limited application to domestic onshore production. Most programs jointly funded by DOE result in the transfer of technologies to a much wider range of problems and thus are more cost effective and useful for increasing the supply right here in the U.S.

Further, federal R&D funds form a crucial element of university programs that foster undergraduate and graduate research initiatives which replenish the corps of future petroleum geologists, engineers and geophysicists. Enrollment in the geosciences departments across the U.S. has decreased by 70 percent in the past 20 years, while international oilfield education has increased significantly. Accordingly, our universities will graduate even fewer technical professionals to maintain an already strained national energy sector. As the age demographics of trained and experienced petroleum workforce continues to edge toward retirement age, DOE's research and development programs serve the additional purpose of helping to attract new students and employees into this vital industry. More than 60% of AAPG members are age 55 or older and increases in graduation of professionals from our universities is critical to national security. DOE's past R&D programs have helped develop broad advances in many oilfield technologies, such as 3-D and 4-D multi-component seismology. New completion and production techniques provide the opportunity to enhance environmental compliance, thus minimizing industry impact to our environment. Many of these technologies were funded under DOE's Reservoir Class Program in the 1990's and are now significantly paying dividends. DOE's oil and gas R&D programs have enabled producers to reduce costs, improve operating efficiency and enhance environmental compliance, while increasing ultimate recovery and adding new reserves.

The full recognition of the vital importance of R&D programs like those sponsored by DOE's Office of Fossil Energy is of paramount importance to the future of our country and our society. No task before our nation is more critical than energy security and this concept is not new—it is a traditional ideal of democracy. But it is time that we moved toward the fulfillment of this ideal with more vigor and less delay. For energy security is both a foundation and unifying force of our democratic way of life—it is the mainspring of our economic progress. In short, R&D programs are at the same time the most profitable investment society can make and the richest return that it can confer. Today, more than at any other time in our history, we need to develop our oil and gas resources to the fullest. Without federal support for R&D programs, this achievement becomes more difficult.

Thank you for the opportunity to present this testimony to the Subcommittee.

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